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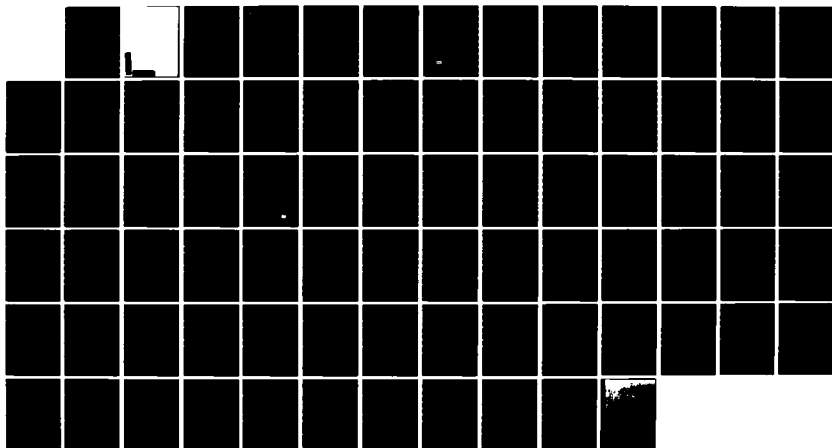
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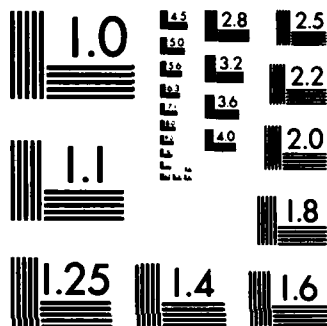
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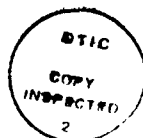
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## **NAVAL MANPOWER RESEARCH IN THE 1980s**

30 June, 1 July 1982  
Alexandria, Virginia

Coordinator:  
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*Manpower, Support, and Readiness Program*

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**INTRODUCTION  
AND  
OPENING REMARKS**

## A CHARGE FOR NAVAL MANPOWER RESEARCHERS

by

The Honorable John S. Herrington\*

*Assistant Secretary of the Navy  
(Manpower and Reserve Affairs)*

Naval Manpower Research in the 1980s, the subject of this volume, is near and dear to the hearts of those of us entrusted with managing naval manpower through the uncertain times ahead. Two themes ought to be paramount in considerations of the role and design of research about military manpower. The first is the requirement for accurate data and information upon which we can base our manpower decisions, and the second is the need to question long-standing assumptions and beliefs in order to assure their validity.

Well-meaning people from many sectors of public life have criticized various aspects of military manpower policy by fervently marshaling statistics and analyses to demonstrate the folly of one or another of these policies. This is their right, of course, and sometimes they are correct. Often, however, they are not because their fundamental data is taken out of context, invalidly manipulated, or possibly, just plain wrong. A crucial part of the job of naval manpower research is to foster truly informed debate. Over a wide range of issues—retirement policy, conscription, educational benefits, military divorces, or whatever—the level of public discussion shows only a superficial awareness of the issues rather than an informed public statement based upon fact. It is here that we turn to manpower research for your accuracy and professionalism to help us recognize and refute invalid arguments, as well as set forth the basic issues in an accurate, straightforward manner.

This is not the only reason we need accurate information from research. The design and management of the manpower, personnel, and training system must be supported by sound statistical data. When we budget money for bonuses, for example, we need to be confident that the budgeted funds are adequate for the number of people who want to reenlist and that we are not faced with large deficits to cover year-end reenlistments.

I challenge you to consider why we are at times unable to specify requirements to a meaningful degree. Also, why must we present retention and recruiting goals in terms of

percentages of the goal, when the goal probably bears little resemblance to the actual requirement? Should naval manpower research really be satisfied by the fact that we've attained our recruiting goals for the last 36 months, or should our researchers continue to analyze the informational basis for our objectives to determine if it can be honed to a more accurate and responsive data base?

That brings me to my other main point. We must reexamine all of our long-held truths about Navy manpower for the '80s. We must look at these often-taken-for-granted maxims from a fresh perspective and from a creative viewpoint without being bound by our traditionally held positions, experiences, and beliefs.

Consider the statistic commonly used about nuclear submarine officers. We shudder when we think that they spend 18 out of their first 20 years in the service at sea, and we were all brightened to see the statistics showing that this figure has been reduced to 14 years; our target is 11 years. However, it's my impression that we need better validation of this type of data before we make statements about the 18 of 20 or 14 of 20 years at sea. I've talked to quite a few nuclear submarine officers about their career patterns, and these conversations have convinced me that these at-sea figures need reexamination by our manpower researchers.

Another assumption that needs your objective review is in the area of retirement. For example, we've said for years that any change in our retirement system will result in a mass exodus of our career force. How do we know this? I challenge you researchers to examine this and provide us with the factual basis upon which we can base our manpower decisions.

We have all heard recently that if career military personnel were forced to divide their retirement income 50/50 with their wives in divorce proceedings, as they do in almost every state in the union, we could decimate the ranks of our armed forces. Is that true? If it is, we ought to know about it.

In 1978, how many researchers predicted a bad recruiting year for 1982? How many of you said then that we would not meet our manpower goals without a draft? Time has proven this maxim wrong. Research must help us ferret out these inaccurate beliefs, which have been altered by time and circumstances before their

\* Mr. Herrington has graciously consented to use of this piece as the introduction to this volume.

inaccuracy becomes so evident that our entire research system becomes suspect.

The information produced by researchers must be clear, scientific, and apolitical. If it is not, we are going to be vulnerable, both to ill-informed attacks and to excessive reliance on traditional beliefs and outmoded

formulas. This is the task of research for the good of the Navy and the good of the country. You must reexamine your commonly held truths. You must try to develop factually accurate and compelling arguments to defend appropriate manpower programs and research. It is not enough to believe. We must be articulate, convincing, and adaptable to changing situations.

## OPENING REMARKS

by

Mr. Stanley A. Horowitz

*Director, Manpower, Support, and  
Readiness Program  
Center for Naval Analyses*

For well over a decade, we at CNA have been observing--and conducting--research on Navy manpower. We have seen substantial progress in the scope and influence of research, but there's a long way to go. Manpower research should concentrate more on areas where major policy insights might be gained.

Some research is focused on issues of narrow concern to particular funding offices; other research is so theoretical and amorphous as to promise little potential. Certainly, there is a place for both basic research and immediate answers to specific questions. What we want to do is try to develop a consensus, a common understanding of what the most fruitful lines of research are likely to be.

Policy makers and analysts inside the Navy and those outside the Navy tend to view each other as adversaries. Yet both are trying conscientiously to promote better policy decisions. Perhaps, by bringing them together in this environment, we can attain better understanding and cooperation, if not total agreement.

Though the purpose of this conference is development of agendas for research, we do not expect monolithic agreement on either research agendas or policies. We do hope that all of us will leave with greater awareness of policy choices that may help the Navy to cope with the environment of the mid-to-late '80s, and indications of lines of research that are likely to help distinguish between policies that merit relegation to the box labeled "cute, but misguided" and those that deserve to be actively pursued.

We hope that the research agendas produced here will follow from a consideration of what policy debates could be resolved, or at least illuminated, by research. Moreover, by concentrating here on prospective research, perhaps we can move especially vexing issues--like the draft or the G.I. Bill--from emotion to analysis.

Though many analytic questions are timeless, their context is changing. Many people think of the '80s as times of unprecedented problems for analysts of military manpower. I think these are also times of unprecedented opportunity. The most productive part of the labor force, people in their late 20s and older, will be in more generous supply than ever before. The Navy can take advantage of this distribution by shifting its focus from the dwindling pool of teenagers.

At the same time, manpower research in the '80s will be different because we have better data and research techniques than ever before. I hope we researchers will avail ourselves of the opportunity to do the kind of systematic, integrative analysis we need.

It seems to me that one of the principal faults of manpower research is that it is subdivided too far. Researchers and policy makers are rarely able to consider how the subdivisions can best fit together. I hope that each of you, regardless of the workshop you are participating in, will consider how the area covered by your workshop is affected by policies in other areas. The Policy Integration Workshop is not the only one that should be concerned with policy integration. In the past, accession policy, retention policy, training policy, and others have typically been set in narrow contexts, with the rest of the system accepted as given. If, as a result of this conference, the Navy manpower and personnel community begins to think more actively about interactions among various kinds of policies, our efforts will have been worthwhile.

**PERSPECTIVE**





## NAVY MANPOWER ISSUES

by

Dr. John T. Warner  
Department of Economics  
Clemson University

### INTRODUCTION

I am happy to be here today to talk to you about Navy manpower problems. CNA asked me to write the paper\* that was distributed to you as a vehicle for prompting more discussion and communication in the defense manpower analytic and policymaking communities about these problems. The paper really should be entitled Defense Manpower Issues, because the issues I will discuss are common to all four services.

It seems to me that these problems may be viewed from two levels. At the macro level, looms the basic issue of what the Navy's and the other services' true manpower requirements are, in terms of both quantity and quality, and whether an adequate supply of manpower can be obtained in the 1980s at reasonable cost. At a more micro level, loom many issues regarding management of military manpower.

Today's compensation and personnel management systems have changed little since the draft era, despite the scrutiny and recommendations of various study commissions, both within and outside the Department of Defense (DoD). There appear to be a number of policy changes that would significantly improve the management of military manpower. Today I'm going to spend most of my time talking about the issues of the optimal manpower mix and the structure of the compensation system.

Having spent the past 7 years as a defense manpower analyst, I have discussed compensation and personnel policy issues with a number of other manpower analysts, military personnel, and DoD policy makers. The main impression that I have from these discussions is that the analysts, at least the economists among them, view these issues from a quite different perspective from everyone else. I want to first discuss how economists approach issues of compensation and personnel management and then apply this approach to what I see as the major compensation and personnel policy issues. The distinction between the

economic approach and other approaches should become clear as I proceed.

### THE ECONOMIC APPROACH

As I see it, there are four primary characteristics of the economic approach to defense manpower problems. The first characteristic is that the economic approach is concerned primarily with efficiency. According to this approach, the goal of manpower managers should be to determine the set of compensation and personnel policies that will obtain the desired force at least cost. This concern with efficiency is in contrast to the concerns of many other people, who tend to weigh such considerations as equity much more heavily.

Economic efficiency is achieved when various resources are acquired such that the additional output or readiness generated by the last dollar of spending is the same, no matter which resource it is spent on. Efficiency thus requires evaluation of the marginal productivity (MP) of each resource, as well as its marginal cost (MC). Further, to economists the relevant costs are social costs, as measured by alternatives forgone, rather than budgetary costs. Policy makers usually focus on the budgetary costs of military manpower, not the social costs.

The second characteristic of the economic approach is the proposition that people respond to incentives. Higher military pay increases supply; lower pay reduces supply. Study after study has confirmed the validity of these propositions. Enlistment supply changes by 10-15 percent for each 10 percent change in military pay. Retention responses are even larger--in the 20-30 percent range.

Recent experience illustrates vividly the responsiveness of supply to compensation. Both the large decline in accession supply and career retention between FY 1976-79 and the recent upswing were driven for the most part by pay changes. Though the evidence suggests that supply is quite responsive to pay, many policy makers, especially those in Congress, continue to think that supply is so insensitive to pay that there is no feasible military pay level that will accomplish the desired manpower goal or that pay cuts will have no deleterious effects on supply.

\* CNA, Professional Paper 322, "Issues in Navy Manpower Research and Policy: An Economist's Perspective," by John T. Warner, Unclassified, Dec 1981.

This is not to argue that pay is all that matters, as economists are frequently misinterpreted as saying. Recent research has shown that non-pecuniary factors, such as the extent of sea duty and separation from family, have a significant impact on retention decisions. These results suggest that the quality-of-life programs that the Navy is now studying may in fact have a beneficial effect on retention in the 1980s.

The third characteristic of the economic approach arises from the recognition that people have diverse preferences for various consumption goods. This diversity of preferences suggests that the compensation system should rely primarily on cash incentives. Cash incentives are more efficient--i.e., have a greater retention effect--than non-cash incentives unless most personnel value those non-cash incentives at at least the cost of supplying them or unless the government has a true cost advantage over the private sector in supplying such incentives. The problem of diversity of preferences leads economists to question the efficiency of many elements of the military compensation system, which relies heavily on non-cash benefits.

The last of the four characteristics that form the core of the economic approach to defense manpower issues is the proposition that personnel prefer current dollars to future dollars; that is, they have positive "discount rates." This preference for current dollars is greatest among young people, whose yearly discount rates have recently been estimated at more than 15 percent. They prefer \$1 today to any amount less than \$1.15 a year from now. These relatively high discount rates help to guide the economist's thinking about a number of compensation issues, notably the structure of the bonus and retirement systems.

#### ISSUES

Let me now apply the four propositions discussed above to what I see as the six major issues of compensation and personnel policy. These are, in order of discussion: (1) the proper manpower mix in terms of quality, (2) the need to insulate pay from the political process, (3) the proper mix of enlistment incentives, (4) the need for more flexibility in the compensation system, (5) a comparison of a salary system with a system of pay and allowances, and (6) the structure of the retirement system.

#### The Manpower Mix

There is a wide gap between how economists view the optimal manpower mix and how the Navy determines its manpower needs.

Manpower "requirements" are based on engineering standards, and tend to be viewed as immutable. As evidence, the paygrade distributions called for in the requirements plans of different ratings are very similar, as are the objective force profiles. As another example, the Navy has attempted to maintain high-school-graduate accessions at about 75-80 percent of total accessions, even if, at times, this has meant falling short of end-strength objectives. Similar quotas have been imposed on the distribution of accessions by mental group and by sex.

This stress on a particular accession mix and a particular distribution of personnel by paygrade and years of service suggests a view of the world in which substitution possibilities between various groups of personnel are zero. This view suggests, for instance, that adding more non-high-school graduates or more lower-mental-group personnel does not make up for the output decline caused by the loss of an equivalent number of high-school graduates or higher-mental-group personnel. Or that the addition of a 5-year careerist does not make up for the output decline caused by the departure of a 10-year careerist.

Yet, from the economist's perspective, it is highly unlikely that the substitution possibilities between various quality personnel are zero. The question thus becomes one of how substitutable various quality personnel are for one another and what quality mix of personnel would provide the desired output or level of readiness at least cost.

Because military readiness or productivity is so hard to measure, these questions have been the most difficult to answer in military manpower research. The few studies that have attempted to estimate the relationship between readiness or personnel productivity and such factors as education, mental ability, and experience include studies for the Gates Commission by Sullivan and by Reaume and OI and more recent studies by Horowitz and Sherman, Albrecht, Jaquette and Nelson, and Gay.

Without attempting an exhaustive review of these studies, let me state their major, albeit tentative, conclusions. First, mental ability has a significant influence on productivity in high-skill jobs but less influence in lower-skill jobs, where overall manning levels are more important. For instance, Gay estimated that in high-skill jobs the productivity difference between mental group I and mental group III high-school graduates is 18 percent; in medium- and low-skill jobs, the estimated difference was only 6 percent. Especially in medium- and low-skill jobs,

personnel with various degrees of mental ability appear to be highly substitutable for one another.

Second, though mental ability appears to be the factor that is most closely related to productivity in high-skill jobs, high-school-diploma status appears to be the more important factor in medium- and low-skill jobs. In addition, attrition studies find consistently that high-school-diploma status is the factor most closely related to the chances of completing the first term of service.

Third, experience seems to be more closely related to productivity than are other measures of quality. Career personnel are between 1.5 and 2.25 times as productive as first-term personnel. The productivity difference between careerists and first-termers is most pronounced in high-skill jobs.

Cooper estimated that in 1974 about 29 percent of the Navy's enlisted billets were high-skill jobs. Even though weapons systems have become more complex, I doubt that the proportion of high-skill jobs is substantially higher today. Overall, the implication of these studies is that the supply of accessions to the Navy has been quite adequate in terms of quality. Whether accession supply will continue to be adequate in the next 10 years at current pay levels is another matter, given the projected decline in the male youth population. Though I don't want to discuss this issue here—I'll leave it to others—I do want to say that a major 1980s issue will be the exploration of alternative sources of higher quality personnel, including increased use of women and older, lateral entrants. Even though the Navy has accessed more women during the AVF era than before, it could access many more without disrupting such factors as sea-shore rotation schedules. In the next few years especially, the market will be ripe for accessing more lateral entrants. Another recurring issue will be the extent to which the Navy's maintenance jobs can be civilianized or contracted out to private companies.

The other major Navy manpower problem during the 1980s will be to build up an adequate career force. In aggregate, the studies cited suggest that careerists are more productive relative to cost than first-termers. The Navy's careerist shortfall is a real one. In the past year, the Navy has made important strides in building up its career force. A major goal of manpower management during the 1980s will be to continue these gains. If the Navy does in fact expand to 600 ships, it will have to increase its career force by about 30,000, just to maintain the current ratio of careerists to first-termers.

Attempts to build up career manning should be aimed at increased manning in the 5-10-year range and in the post-20-year range, rather than the 11-20-year range. The evidence suggests that careerists in the 5-10 and 21-30-year ranges are more productive relative to their cost than careerists in the 11-20-year range. More post 20-year personnel could be obtained by easing restrictions on the number of high-grade personnel and by changing the retirement system. I'll address the latter issue later.

#### The Political Process and Stability of Compensation

As I stated earlier, both the large declines in accession supply and retention between FY 1976-79 and the recent upswings were driven for the most part by pay changes. Military pay declined relative to civilian pay, for a variety of reasons--caps on federal pay raises, reallocations from basic pay to allowances, a substantial reduction in first-term bonuses, erosion of the value of fixed-compensation items, and elimination of the GI Bill. The recent upswings in accession supply and retention were caused in large part by the pay raises recently implemented, especially in FY 1981 and FY 1982.

This experience reveals a political cycle in military compensation. In years when accession supply and retention seem good, politicians think they can cut pay without any harmful consequences. Later, after the cut has done its damage, the politicians wake up to the problem and raise pay. One can see signs of this cycle repeating itself again. Now that the services are experiencing very good accession supply and retention, there is a move afoot in Congress to rescind some of the gains in compensation.

It seems to me that this experience illustrates the need to maintain more stability in the compensation system. I don't mean by "stability" that the compensation system should be fixed forever in its present form. Rather, I mean that once the appropriate mix of compensation items has been selected and the appropriate level of relative military-civilian pay achieved, this level of relative pay should be maintained on a stable basis.

Perhaps it is naive to think that such stability can be achieved, given the pressures on Congress. Yet, perhaps the political cycle in compensation can be minimized by the establishment of an independent Military Pay Board that would keep track of compensation and retention trends on a regular basis and make recommendations to Congress on the form and level of yearly pay raises. Such a board was

recommended in 1976 by the Defense Manpower Commission.

Let me turn now to what I see as the major issues concerning the structure of the compensation system.

#### The Proper Mix of Enlistment Incentives

The GI Bill was eliminated in December 1977 and replaced with the much less attractive Veterans Educational Assistance Program (VEAP). At the time, a number of politicians and DoD officials predicted little impact on recruiting, but Larry Goldberg estimates that this single change in program reduced high-quality accessions by 15 percent between FY 1977 and FY 1980.

This experience with the GI Bill raises a whole set of policy issues. What is the appropriate mix of first-term pay, enlistment bonuses, and educational incentives? Should we return to the GI Bill? What is the appropriate mix of compensation incentives versus extra recruiting resources? Answers to these questions depend crucially on the desired quality mix of accessions and on such other considerations as the "spillover" benefits of educational expenditures and the benefit of having a force that is socially more representative.

Supporters of a return to the GI Bill believe that the elimination of the GI Bill and the increased emphasis on up-front cash incentives, such as higher pay and enlistment bonuses, were mistakes because high-mental-group personnel are much more responsive to changes in educational incentives than in active-duty pay. The argument in favor of returning to the GI Bill assumes implicitly that the Navy and the other services don't have enough high-quality accessions and that the GI Bill is the only incentive short of a return to the draft that will induce high-quality individuals to enlist. Further, GI Bill supporters stress the general social benefits of a return to the GI Bill: a socially more representative force (a high proportion of upper-mental-group accessions are white) and more human-capital formation.

Economists generally see the GI Bill as an expensive enlistment incentive, and they argue that the same accession mix, or an alternative accession mix of equal effectiveness, can be had more cheaply with the use of other policy tools. Contrary to the above arguments, economists expect that such recruiting tools as enlistment bonuses will be more efficient than the GI Bill because enlistment bonuses can be targeted to occupations where shortages exist, whereas GI Bill entitlements

accrue to all enlistees, and because young people discount prospective GI Bill benefits so greatly that smaller up-front cash benefits provide the same incentive as costly but deferred educational benefits.

Another consideration is the fact that the chance to take advantage of GI Bill benefits induces the departure of many experienced personnel, including personnel who were not motivated to enlist because of the GI Bill, in the first place.

At this point, the weight of evidence on costs is on the side of the economists. A new GI Bill would cost about \$2 billion a year. Goldberg calculates that the extra accessions generated would cost more than \$100,000 apiece. Alternatively, a marginal accession brought in by extra recruiters and advertising is very low—about \$3,000—though the costs of these tools probably rise quickly with expanded use. It is clear that other recruiting tools are much cheaper than the GI Bill.

A more general argument against returning to the GI Bill is that it does not focus resources on the most severe problems. If, in fact, career manning is the major problem, the \$2 billion that would be spent on the GI Bill would be much better spent on careerist compensation items such as reenlistment bonuses. Note that the services currently spend less than \$1 billion a year on reenlistment bonuses.

When the general social benefits attributable to a GI Bill are added in, the scale may be tipped the other way, but I doubt that these benefits could outweigh the cost differences.

#### The Need for More Flexibility in the Compensation System

One of the notable features of the military compensation system is the lack of occupational variation in compensation. There is a single pay table for all occupations, and the reenlistment bonus is the only major tool of discretionary policy. Even though the Navy has more discretionary pay than the other services, special pays such as sea pay and submarine pay were so small as to be meaningless before FY 1981. Even with the recent increase in sea and submarine pay rates and the introduction of a Variable Housing Allowance (VHA), outlays for bonuses and other special pays (including VHA) were only 12 percent as high as the outlays for basic pay and allowances; that is, almost 90 percent of enlisted compensation is still in the form of non-discretionary items.

The lack of occupational variation in compensation is the outgrowth of a philosophy that stresses equal pay for equal responsibility, that believes pay should vary by rank and experience, not by occupation. This philosophy views as "unfair" the notion that personnel of similar rank and experience should be paid differently just because they are in different jobs. This philosophy stresses equity in compensation.

Proponents of this philosophy also argue that too much variation in compensation is undesirable because it leads to morale problems and lower performance, at least among those in the lower paid occupations. (I hear this argument frequently from history and English professors at Clemson University.) While there may be something to the argument that too much occupational variation in compensation hurts morale and hence productivity, I know of no empirical evidence on the subject. A result of this philosophy of equity in compensation is that general pay raises must be used to solve recruiting and retention problems.

Economists, on the other hand, stress the inefficiency caused by the lack of occupational variations in compensation. The inefficiency, of course, lies in the considerable variations in supply-and-demand conditions across occupations, variations so large that, at a given pay level, some occupations will be experiencing shortages while others are experiencing surpluses. General pay raises are a costly solution to the problem of shortages in selected occupations because pay is raised more than is necessary to retain personnel in skills or lengths of service where shortages don't exist. General pay raises can also raise the costs of other compensation items--notably retirement pay. Economists therefore favor more flexible compensation tools, including reenlistment bonuses, multiple pay tables, and expanded use of special and incentive pays.

Most analysts prefer to expand the use of reenlistment bonuses. Bonuses are the most flexible of the options cited, and they need be paid only at career points where retention is a problem. Use of bonuses rather than general pay raises minimizes the superfluous increases paid to those who would have stayed in any event.

Most economists favored the FY 1979 switch to lump-sum bonuses because they would have a greater retention effect than installment bonuses. Again, lump-sum bonuses should have a greater effect than equivalent installment bonuses because of the discount rates in the minds of the people who receive them. Also, since bonuses are now based on paygrade at reenlistment, inflation reduces the real

value of the future, fixed installments and hence their retention effect. A recent policy change to pay bonuses half in lump sum and half in installments was opposed by economists on the same grounds.

Though simply expanding the use of bonuses has considerable merit, several arguments have been advanced in opposition. First, bonuses--especially lump-sum bonuses--are not a highly visible element of compensation, and surveys show that personnel tend to forget about the bonuses they have received when asked about their compensation level. Second, there is the somewhat paternalistic fear that most lump-sum bonus recipients squander the money and spend the next few years starving and regretting their reenlistment. This argument suggests that lump-sum bonuses may have a detrimental effect on subsequent job performance.

A way to alleviate these objections to bonuses would be to incorporate bonuses into the monthly pay check and base each month's payment on the individual's current basic pay. Such a system would increase the visibility of bonus payments, reduce or eliminate the effect of inflation on fixed-installment payments, and increase the incentive to perform and advance.

There are several technical problems with the bonus program. The first is that, over time, the fixed legal maximums on bonus payments induce personnel to reenlist for shorter periods. Even with the recent increase in these caps, personnel in occupations receiving level 5 or 6 SRBs may receive the maximum bonus for only a 3- or 4-year reenlistment. In my view, the maximums should be eliminated. Another change would be to graduate the bonus multiples according to the length of reenlistment. This is now done for doctors. Although such a change has not been well studied, it might increase the incentive to reenlist for longer periods.

An alternative to expanded use of reenlistment bonuses is multiple pay tables; that is, each occupation can have its own pay table, and the table can be adjusted as supply-and-demand conditions dictate. Multiple pay tables have recently been advocated by Binkin and Kyriakopoulos. The primary argument against them is that they might become too unwieldy in practice.

Special and incentive pays offer another mechanism for introducing more flexibility into the compensation system. The major reason for expanding their use rather than bonuses is the fact that they may provide incentives that bonuses do not. For example, the Navy has

experienced a significant increase in voluntary extensions of sea duty in the wake of the new sea and submarine pay rates. The recent increase in sea pay was especially important because voluntary extensions of sea duty, coupled with the greater retention brought about by the sea pay, may prove to be a less costly way of improving sea manning than merely increasing total strength.

The primary argument advanced against increased use of special pays is that these pays are themselves inflexible and that they cannot be turned off the way bonuses can if retention gets too high. My answer to these arguments is that occupations that would benefit the most from higher special pays are already high-bonus occupations. Any tendency for retention to rise too much in these occupations can be offset by a cutback on bonuses.

#### The Proper Mix of Direct Cash Compensation and In-Kind Benefits

As I said earlier, much military compensation has been in the form of in-kind rather than direct cash benefits. What is the optimal mix of direct compensation and in-kind benefits? This question is hard to answer, but it points up a major difference of opinion between economists and others. Many high-ranking military officers and some academicians have defended the current mix on the ground that the current pay-and-allowances system differentiates the military from civilian employers and that it serves to stress the "uniqueness" of military life. They link the mix of cash and in-kind incentives to job performance, suggesting that a system that is heavy in in-kind benefits will attract individuals who are more committed to the military while a system that is heavy in direct compensation attracts only those people who are "in it just for the money." The implication is that there is a link between the incentive package and job performance.

But, as I noted earlier, economists stress the negative aspects of compensation systems that are heavy in in-kind benefits. Work at Rand by Chow and Polich shows that because in-kind benefits are not particularly visible, personnel tend to understate their total compensation. They also found that because personnel understate their total compensation, retention is lower than it would be under a salary system. Even if personnel were fully aware of their compensation, retention might still be lower under a pay-and-allowances system because of the problem of diversity of preferences (although there is no empirical evidence on this point).

Despite the work of Chow and Polich linking retention to the visibility of the compensation system, it seems to me that there are many unanswered questions in this area, including what kinds of in-kind benefits are most important in terms of their retention effects, whether the kinds of people who are attracted to the military and their performance on the job are, in fact, influenced by the mix of in-kind and cash benefits, and what mix would enable the military to meet its manpower objectives at least cost.

At the risk of sounding like a non-economist, I would like to raise an equity issue here. It pertains to the pay differential between married and single personnel. When members of the President's Commission on Military Compensation (PCMC) made field trips to discuss compensation issues with the troops, single personnel frequently cited this differential as the one element of the compensation system with which they were most dissatisfied. The differential has not been studied for its effects on morale and productivity; this anecdotal evidence suggests that it should be.

#### The Structure of the Retirement System

Much has been written about the military retirement system in the past 10 years. At least five proposals have been advanced to change it, the most recent being a proposal drafted by the Office of the Secretary of Defense (OSD) after its review of the report of the PCMC. Like the PCMC plan, the OSD plan would provide significant cash benefits to those who complete 10 years of service, would substantially reduce 20-year benefits, but would maintain 30-year benefits at about their current level. The main difference is that the PCMC plan would provide a much stronger incentive for personnel to complete 30 years of service. These plans were controversial, and the services' reaction to them was quite negative. They were viewed as attempts to cut retirement costs with nothing in return. Indeed, though the PCMC paid lip service to the need for restructuring the whole compensation system, it offered few specific recommendations other than its retirement proposal.

Despite the adverse reaction to these plans, I believe they have merit, on two grounds. One, the current compensation system does not produce the greatest possible retention per dollar of manpower expenditure. Two, the retention pattern produced by the current system is suboptimal.

The first premise is based on empirical evidence that personnel in general, and young

people in particular, have discount rates that greatly exceed the government's discount rate. The government's cost of providing future retirement benefits thus exceeds the value placed on them by the people they are trying to reach. Reallocating compensation away from retirement pay and toward active-duty pay would raise retention among young personnel. Reducing 20-year benefits while keeping 30-year benefits at today's level would substantially increase post-20-year retention.

The premise that the current retention pattern is suboptimal is based on the previous discussion that marginal productivity relative to marginal cost (MP/MC) is not the same for personnel with different lengths of service. Specifically, MP/MC is much lower for mid-length careerists than for either young careerists or older careerists. Hence, the services could increase by raising the number of 5-to-10-year careerists, lowering the number of 11-20-year careerists, and raising the number of post-20-year careerists. The OSD and PCMC plans would have precisely such an effect on the career force profiles.

#### Other Issues

I've spent most of my time today talking very generally about the optimal manpower mix

and about how the compensation system should be utilized to bring about this mix. I have neglected to talk about many personnel management issues, not because they are unimportant, but because there are many persons here who are better qualified to talk about them. Examples of these issues include how to manage first-termers so as to increase their performance and reduce their attrition, the effects of various rules and regulations on morale and performance, the use of guaranteed assignment and shore-base homesteading programs to improve career retention, and new ship maintenance concepts that might reduce the arduous aspects of sea duty.

Finally, let me say one thing I've noticed about the manpower planning process: It is too disjointed. Requirements plans, accession plans, retention plans, training plans, sea-shore rotation plans, etc. are prepared by different groups, and the overall plan that results is often internally inconsistent. This problem arises because the yearly POM cycle is too short to allow coordinated planning and because the analytic tools required for better coordinated planning are lacking. I therefore conclude with a plea for the analytic community to get busy developing these tools and for the policy-making community to make better use of the tools that are developed.

**SESSION I**

**THE DEVELOPING MARKET FOR MILITARY MANPOWER**



## THE DEVELOPING MARKET FOR MILITARY MANPOWER: CHALLENGE

by

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First, I'm a strategic planner, not an economist--as may become obvious. The two broad topics I want to talk about today are: First, what should we make of the recent successes in recruiting and retention numbers? Does this mean that we do have the right strategy to survive the '80s or not? And, second, whatever we make of these numbers, what flexibility in our strategy do we need to survive through the '80s in case things change?

I believe, in general, that we may need a new strategy because, though the recent pay raises were justified and definitely needed, the numbers are mainly a reflection of the general economy. National unemployment--considering that the auto industry alone laid off 300,000 last year--will put the retention numbers into a little perspective. Second, there are many adverse trends for Navy manpower, personnel, and training (MPT) in the labor and education markets that we need to discuss. Such trends not only indicate that we will have more competition for workers but also highlight the changing characteristics of the national work force.

I began the work I will discuss today on the Long-Range Strategic Planning (LRSP) Project in Op-11, which attempted to apply business policy techniques to Navy manpower problems. It's the same kind of approach that led to Op-00X's foundation. "Strategy" here does not mean nuclear weapons; it means the kind of match or mismatch an organization achieves with its environment. For Navy MPT, the environment is twofold--the Navy mission, on the one hand, and the labor market, on the other. The manpower competitors we face are IBM and General Motors, not the Russians. The concern is how to develop the best possible strategy for MPT to compete.

Today I'm going to discuss some alternative strategies in a broad-brush fashion, see how opportunities and threats in the environment will affect them, and look at their likelihood for success over the '80s.

In deference to economists, I would say that the strategic purpose of Navy MPT in economic terms is to increase personnel supply, decrease manpower demand, or alter MPT total force shape so as to maintain operational readiness over both the short term and the long term. In fact, one of the key things

that MPT does in establishing policy is to determine how to translate demand into requirements and supply into personnel. This highlights the policy elements that really focus how we think about or misinterpret these concepts.

Consider how we judge success in manpower. [SLIDE 1] Here are four general kinds of familiar measures. We can call these three cases: the late '70s problems, the current success, and the '80s goal for the 15-battle-group Navy. The accession numbers are better for 1982 than for 1978, particularly in the higher mental groups. The accession forecast for 1987 to meet the 15-battle-group Navy is not precise. But people seem to agree that it means enlisting about one-third of its recruits from among high school graduates, rather than the one-fifth figure of today. Similarly, masked in some of these numbers is the petty officer shortfall. If 22,000 isn't a good number, Op-11 requirements people say that the shortfall in the top 5 ratio is more likely to be 29,000. Maybe we can popularize that number today.

Slide 1

### KEY MANPOWER SUCCESS MEASURES

	1978/9	1981/2	80: GOALS
1. END-STRENGTH	455K	470K	500K
2. ACCESSIONS			
• TOTAL NPS MALES	72K	84K+/74K+	-
• % MGI & II	32%	41%	-
3. RETENTION			
• 1st TERM %	39%	42 - 53%	47%
• 2nd TERM %	46%	57 - 69%	67%
• 3rd & BEYOND %	92%	94 - 97%	98%
4. PETTY OFFICER SHORTFALL	23K	22K	0

Recognize, too, that the retention rates needed throughout the '80s require the levels of 1982; even the levels of 1981 are too low. Also masked is the retention of highly technical ratings. Some studies were done in Op-110 to classify ratings; roughly 17 percent of the force were estimated to be in ratings requiring highly technical skills. I'll talk more about that later. These higher-skilled technicians tend to be in mental groups I and II, which have increased from 32 percent of enlistees to 41. During the early '70s, 40 percent of Navy recruits were mental group IIs. These are the people needed for the highly technical ratings. But the fact is that we've been able to skim the best from potential

recruits recently. For example, the number of people who took the AFQT went up by 50 percent last year. That may not continue.

Let me just lay out some broad scenarios to examine possible strategies. [SLIDE 2] We have four key variables, from requirements to labor competition; I've labeled three scenarios as optimistic, pessimistic, and LRSP-view. The optimistic is not the current strategy, since there is now no pay comparability across the board. Still, the current tendency is for growth in MPT requirements with an unexplicitly recognized change in quality mix, as John Warner was discussing.

#### Slide 2

THREE SCENARIOS FOR THE 1980s				
KEY VARIABLES				
SCENARIOS	GROWTH IN MPT REQUIREMENTS	PAY LEVEL VS. CIVILIANS	UNEMPLOYMENT	INTENSITY OF LABOR/EDUC. MARKET COMPETITION
1. OPTIMISTIC	INCREASING STEADILY, BUT LITTLE QUALITY MIX CHANGE	ACROSS-THE-BOARD COMPARABILITY	MODERATE; SLOW DECLINE	NOT MARKEDLY INCREASED
2. PESSIMISTIC	INCREASING EQUALLY ACROSS THE BOARD	AVERAGE MIL/ CIV PAY 20% LOWER	LOW; QUICK DECLINE	INTENSE ACROSS THE BOARD
3. LRSP-VIEW	INCREASING WITH PARTICULAR DEMAND FOR HIGHLY TECHNICAL SKILLS AND FOR SEMI-SKILLED	GENERAL COMPARABILITY, BUT NOT FOR TARGETED HIGH SKILLS	LOW; SLOW DECLINE	INTENSE FOR HIGH QUALITY, TOUGH FOR OTHERS

The second key component of the optimistic strategy is that pay comparability will be maintained to attract more people; now we do not quite have comparability, particularly for some of the higher skills. Comparability is coupled with an unemployment assumption caused by a stagnant economy--as most non-government economists are forecasting, with unemployment declining to 7 percent over 2 years or more. Therefore, from this optimistic scenario we can expect results that are roughly like those of 1982 or, at worst, 1981.

The more pessimistic view could result from a shift in the political climate. It includes increasing requirements across the board because of new hardware systems, if not new platforms. Relative pay would drop to what it was in the late '70s, coupled with a quick economic recovery. This would lead to manpower numbers that are worse than those of 1978.

The last view, which I hope to support today, states that there will be a growth in requirements, particularly in the highly technical skills, as we move toward the

15-battle-group force. But we will not be able to maintain pay comparability for higher skills because of political limits on pay increases. Further, we will be in a tough, competitive labor market. This means that we may be able to meet the 1981 numbers overall but probably not for the high skills.

Now, what can we do for any of these scenarios? I want to characterize several strategic questions that focus on supply, demand, and policy. Three key strategic questions for MPT are:

1. Why does someone join or make a career in the Navy (or leave the Navy)?
2. How can the Navy best use its total force personnel resources?
3. How can the Navy convince decision arenas of its answers to questions 1 and 2?

Later, I'll identify the kind of research we need to answer these questions.

Given these scenarios, I see three basic strategic alternatives. [SLIDE 3] They are characterized in shorthand by their main component: indexed pay, a 50/50 first-term-to-career-force, and the LRSP-recommended strategy.

#### Slide 3

BASIC MPT STRATEGIC ALTERNATIVES			
STRATEGY	DIMENSION		
	DEMAND	SUPPLY	POLICY
1. INDEXED PAY	LITTLE HARDWARE POLICY CHANGE	INDEXED PAY TO ATTRACT/RETAIN TRADITIONAL SOURCES	SOME PERSONNEL POLICY CHANGES BASED ON PILOT PROJECTS
2. EXPERIENCED FORCE 50/50	SOME HARDWARE AND OPERATIONAL POLICY CHANGES	RELiance ON IMPROVED JOB SATISFACTION AND PAY	PERSONNEL POLICY CHANGES TO IMPLEMENT 50/50, E.G., TECHNICIAN CAREER
3. STRATEGIC PLANNING PROJECT	SIGNIFICANT REDUCTION IN HARDWARE AND OPERATIONAL REQUIREMENTS	UTILIZATION OF NON-TRADITIONAL INPUTS AND A TOTAL FORCE REALIGNMENT	SIGNIFICANT PERSONNEL POLICY CHANGES TO ADJUST TO FORCE CHANGES

The indexed-pay strategy would not require changes to hardware policy, though the Hardman group would review requirements, but would not necessarily attempt to reduce requirements. Indexed pay would be the major supply concern. The overwhelming emphasis is on attracting and retaining traditional sources to maintain necessary flow rates of

personnel. Personnel policy, therefore, would not need to be changed much, though pilot projects, such as lateral entries, might be used. But, by and large, the perspective of the preferred personnel policy would retain two key components: A supervisor is what a petty officer should be, and a sailor is a sailor first, whether he is an ET or a boatswain's mate.

The concept of the 50/50 experienced force follows from the Defense Resource Management Study and other studies in the '70s. The purpose was to make better use of senior technicians. The Navy would increase pay and job satisfaction by letting careerists be technicians, not supervisors, if they wished. The same would apply to officers who wanted to remain engineering officers or pilots for 20 or 30 years. To implement such explicitly technical careers would require changes in personnel policy.

The LRSP project declared that the Navy should consider the "design to the man" concept, which has been kicked around, and reduce qualifications for jobs where the Navy is unlikely to get enough of the traditional kinds of people. Further recommended were new supply sources, such as programs that make better use of community college graduates. These changes require significant changes in policy.

Why strategy two or three may be necessary follows from a review of the environment. Let me summarize some environmental trends--very briefly because the next two speakers will talk more about the labor market. First, look at this table [SLIDE 4], which was prepared in Op-11 to compare requirements between new systems and the systems they replace. The new systems--shown as the lower of the two--have more operational capability, but that is not the point for MPT. The key concern is the extent to which they increase careerist or highly technical requirements. Except for the submarine community, they do.

The three technology skill groups shown are very different. This split of ratings into semi-technical, technical, and highly technical began in Op-110 with a look at average mental groups and training loads and then a review by commanders from all the communities. For example, we analyzed the inventory for the second term and found that the mental groups for the semi-technical ratings are roughly 50/50 between III lower and III upper mental groups. For the technical, it was weighted 2 to 1 for III upper vs. IIs. Highly technical sailors are, on average, mental group IIs--meaning that for each III upper there is a I.

The total 1986 requirements for the 15-battle-group Navy were estimated by Op-110 to represent an increase over 1981 of 70,000 overall; the Navy will need to increase 13 percent in the semi-technical, 16 percent in the technical, and 31 percent in the highly technical ratings.

Slide 4

CHANGES IN STAFFING AND SKILLS MIX FOR SELECTED SYSTEMS			
	MARK III vs. MARK I LAMPS	DD 963 vs. DD 931	SSBN 726 vs. SSBN 596
CHANGE IN:			
• TOTAL STAFFING	+ 23%	- 22%	+ 5%
• FIRST TERM	- 41%	- 57%	- 60%
• SECOND TERM	+ 64%	- 7%	+ 3%
• BEYOND	+ 44%	+ 7%	+ 21%
• SEMI-TECHNICAL	+ 14%	- 56%	- 19%
• TECHNICAL	+ 11%	- 9%	+ 9%
• HIGHLY TECHNICAL	+ 54%	+ 57%	+ 6%

Compare that desired increase with labor market trends. Here are five key trends in the labor market:

- The ratio of skilled to unskilled workers continues to rise.
- The Bureau of Labor Statistics (BLS) predicts that, during the '80s, the demand for skilled technicians will grow at twice the rate of the demand for unskilled workers.
- Civilian technician jobs with high growth expectations--up to 25 to 50 percent--over the '80s include machinists, electricians, and mechanics.
- Job growth has been greatest in small businesses and is forecast for high-technology and service industries.
- Defense industry expansion and U.S. "reindustrialization" will strengthen these trends.

In the mid-60s, 35 percent of all blue-collar workers were skilled; now it's 40 percent. Further, the civilian technician jobs that are really growing are exactly where we have our rating problems. This does not mean the Navy cannot get these workers; it means that pay

and job satisfaction must rise to meet the competition from industry. These workers will be much more expensive and much more marketable. About 80 percent of second-term journeymen now go to jobs in their rating areas.

These changes mirror changes in the educational market, such as the explosion of people going to college and, particularly, the phenomenon of community colleges. Both 2-year and 4-year institutions are now starting to market themselves much more and to focus on job skills instead of liberal arts. Witness the recent demise of many small 4-year schools. This shows that we are going to have more competition from colleges.

To characterize changes in the American work force, consider the highest educational achievement of people 25 to 29 years old. In 1960, 3 percent had graduate degrees, 8 percent college degrees, and 50 percent high school diplomas. In 1980, 7 percent had graduate degrees, 16 percent college degrees, and 9 percent two-year degrees, and another 54 percent were high school graduates; 14 percent were not high school graduates.

The point here is not retention per se but to show what has changed about the American work force in the last 20 years. In 1960, about 11 percent were college graduates; now 32 percent have some kind of degree. This constitutes a significant increase in the educational level of the American work force. That has many implications for workers' career expectations and expected educational attainment.

So, how does the Navy attract them? If you compare this educational breakdown with the military, which has about 12-13 percent officers, it's clear that the military fits more into what things were like in the '60s.

Of course, the military is more technology-intensive, but in the '50s, the proportion of highly technical people in the military was only half as great as the proportion in the total labor market; now the military is twice as technical as the work force. This, of course, is why bonuses are now needed to attract highly skilled people; that is how the military intends to adjust to this environmental trend.

Concerning the worth of apprenticeship programs, there is a chance that American businessmen will learn from the Germans and Japanese; such programs will mean competition for Navy training.

To summarize this environmental assessment, these are the key points:

- Mission/technology--growth in Navy role, platforms, complex equipment, and demand for skilled technicians.
- Labor market demographics--reduction in availability of 17-to-24-year-olds plus increased competition for highly skilled technicians and unskilled service workers.
- Education--continued expansion of community colleges and technical schools with greater governmental and industry involvement.
- Political--decreased federal spending with increased DoD share, although predominantly for hardware; no draft.
- Sociological factors--higher expectations and desire for control over own life, coupled with more aversion to dissatisfiers.

This means that the traditional pool is declining, that there's a greater need in the Navy for highly technically skilled people, and that both companies and educational institutions will be looking for these same people, though, in some cases, providing them. As to political trends, I'll just note in passing the problems with the SRB freeze and Jane Bryant Quinn's comments on military retirement, as discussed earlier in the day. As to sociological trends: Several surveys indicate that after the recession is over, quality of work and quality of life may return as major personnel concerns.

Naturally, this environmental assessment clearly supports the LRSP scenario that I gave earlier. However, even if you don't accept this assessment, you can use it to fine-tune any of the three possible strategies. And the way you do this, returning to what John Warner said, is with total force trade-offs. As a strategic planner, I submit you cannot address them on a billet-to-billet basis.

Four major kinds of total force trade-offs to examine are:

- Experience mix, including first-term-to-career ratio.
- Skill mix, e.g., 31 semi-technical, 52 technical, and 17 highly technical--as now--or perhaps a 15-75-10 mix.

- Specific total force trade-offs, such as enlisted technicians versus contractor technical representatives afloat.
- Aggregate total force mix of actives, reserves, civilians, and contractors.

The experience mix is now 57 or 58 percent first term. Several studies have estimated savings from \$1 billion to \$3 billion if the military go to a force of 50 percent first term and 50 percent career. If the Navy went to a skill mix such as only 10 percent highly technical, it would not have to compete as strongly for the highly skilled workers and mental group IIs.

There are other trade-offs that the Navy has implicitly made. For example, in the specific trade-off of enlisted technicians versus contractor tech reps, consider that some aircraft carriers have 100 civilian technicians who are essentially working as highly skilled journeymen. If you examine how many highly skilled journeymen there are onboard, this means that something like one out of four is a civilian. Is that what the Navy really wants? Also, the total force mix choice most often discussed is to reduce military actives ashore and use civilians more. Perhaps the real military/civilian trade-off is using civilian designers to make simpler equipment. That's clearly what the Russians have done in going to a 90/10 first-term-to-career mix, although this is slightly misleading, since they use warrant officers more than we do.

It's clear that to maintain a preference for the current total force mix despite the increase in high technology, the Navy will need very high retention rates with very high pay. We should look at what kinds of alternatives there are. Basically, the Navy can decrease demand, increase supply, or alter the total force mixes.

The number of opportunities examined by LRSP are ones you've all heard; so, I won't dwell on them.

The Navy can reduce demand through operational initiatives such as homesteading or the Sea Horse (continuous sea duty) concept, which assigns a sailor to the same ship for 20 years. This ship is staffed at 133 percent of SMD requirements, divided into four, rotating sections. For example, two sections are on board in port and three sections when deployed—with the other section helping other ships with training or maintenance in the home port. Increasing gains through expanding personnel supply would include an ROTC-like program for community colleges, where graduates

would become warrant officers. Such programs have been discussed by Op-01 and some community colleges.

I'm supposed to be the pessimist today, but let me show some optimism about the flip side of the declining number of 17-21-year-olds; it is the large increase in 25-44-year-olds. Now, the question is: How do we use them? Each of the three strategies has a different answer. The indexed pay would maintain them as petty officers through higher pay. The 50/50 approach would use pay to retain senior technicians—though senior may be only second or third term—and use them more efficiently. The LRSP option would move toward more total force usage or changes in skill mix.

I think that when you consider the current mix of 12 percent officers and 88 percent enlisted, you reconsider the sources the Navy is drawing from. There are two points about this. One, the Bureau of Labor Statistics estimates that 15 percent of the jobs in the American economy require professional or technical degrees. Now, roughly 17 percent of the whole work force are college graduates; in the '80s that number will climb to 21 percent. The question is: Can the Navy use any of these people better than it does now? All of them have expectations for higher educational attainment, either before the Navy, after the Navy, or instead of the Navy. There are liberal arts majors who can serve as officers in some of the softer technical areas; there are community college graduates, who can be used directly as civilian technicians. The second point about the changing age mix is that if the military plans to recruit one out of three high school graduates, we should recognize that approximately 40 percent of them have higher educational ambitions, which we can either ignore or build on, if we integrate better with the market.

How the Navy would use these people is the kind of overall size and consideration I have been emphasizing, because it addresses how a strategy would use the supply for the different skill categories. Some of the work that John Warner did in retention analysis found big differences in pay elasticities for different skill categories. For example, for second-termers, a 1 percent increase in relative pay would increase semi-technical retention by 2.8 percent, but highly skilled retention by only 1.5 percent. This means that significantly higher pay raises are needed to retain ETs and DSs; the projection is that it will be worse during the '80s. Such research on pay elasticities is what is needed to help planners. To do good planning or policy development, the Navy needs to know the labor supply—not just the incremental movements,

but the entire labor supply curve. Then we can ask: What share of the market does the Navy have to gather over the '80s? Second, there are some key assumptions, such as those John Warner raised about the desired mix of supervisors and technicians, productivity, and how these affect personnel policies.

The key concerns that we have found in the strategic planning project concerning manpower and staffing were:

- First term/career mix.
- Semi-technical to highly technical mix.
- Relative skill and experience productivity.
- Supervisor/technician ratio in ratings.
- Supervisor/worker ratio.
- Maintenance afloat/in-port philosophy.
- Sea/shore rotation assumptions.

Personnel supply and maintenance concerns were:

- Total force alternatives.
- Reliance on bottom entry, up-or-out versus lateral entry and non-traditional careers.
- Adjustments to changes in U.S. educational system.
- Across-the-board versus targeted compensation.
- Reliance on pecuniary versus non-pecuniary rewards.

The first term/career mix has been much discussed in general, but there are many considerations about the mix of semi-technical versus highly technical that must be discussed simultaneously. Often, during hardware design, a package of skills is translated very quickly as a 2nd class whatever. With that packaging, the designer has implicitly made the key manpower trade-off during the design stage. But relative skill and experience productivity considerations are keys. In looking through the research, the LRSP group found numbers for career versus first-term productivity to be something like 1.9 to as high as 3.4. Several studies have also shown that in different

ratings the effect of experience on productivity varies widely from making very little difference to making a big difference.

For a trial sizing exercise, we assumed 2.4 relative productivity, to determine what size 50/50 first term/career force was equivalent in productivity to a 58/42 force. We found you get the same operational output with a force about 35,000 lower in end-strength but requiring 20,000 more careerists. That's clearly a smaller, more productive force, but can we get that many more careerists? One of the interesting things that this analysis showed was that the supervisor/technician ratio—which in the NOTAPS data base is roughly two supervisors for every technician—fell to a 1-to-1 ratio in this trial. If true, this would free careerists to do more technical work, which is the stated preference of many of them. Similarly, this supports lateral entry, since such technicians would not necessarily have to learn to supervise many sailors. This kind of analysis was a tentative attempt to find out what kinds of numbers were available.

We found also, for example, that the supervisor/worker ratio in the data base is about 4.5 to 1. We're not sure why. The number of sailors desired for different watch stations leads to such a number. But an analyst also must consider the so-called "agricultural billets" for E-3s. These exist because you've got to have E-5s. But to have an E-5 you've got to have enough E-3s to survive and "grow" an E-5. But then you need an E-5 to supervise them. This interaction of personnel versus manpower considerations obviously confuses attempts to make significant size or shape changes to the force. Hence, we need research on the key items I mentioned. But the point for planners and policy makers is that there are various assumptions that are not unearthed by billet-by-billet analysis. Such assumptions are buried throughout manpower analyses.

For personnel research, the key need is for more labor market analysis, perhaps at a micro level of individual ratings, to see what kinds of industries the Navy is competing with and what the expectations of those potential workers are. Looking at these kinds of considerations and going back to the three scenarios—indexed pay, 50/50, and LRSP project—note that each of them has some key assumptions about manpower, personnel, and political considerations. For indexed pay, clearly, there's a political constraint. In 5 years, will Congress approve \$50,000 bonuses to keep ETs? If you think the answer is no, there is a difficulty with that strategy. Similarly with the 50/50 strategy: Will sailors with highly marketable skills want to go

to sea? A problem with the LRSP-proposed strategy is that it may shift too much from tradition, making it unworkable in the way that it is viewed, not just by decision makers today, but also by the committed people in the force whom the Navy most wants to retain.

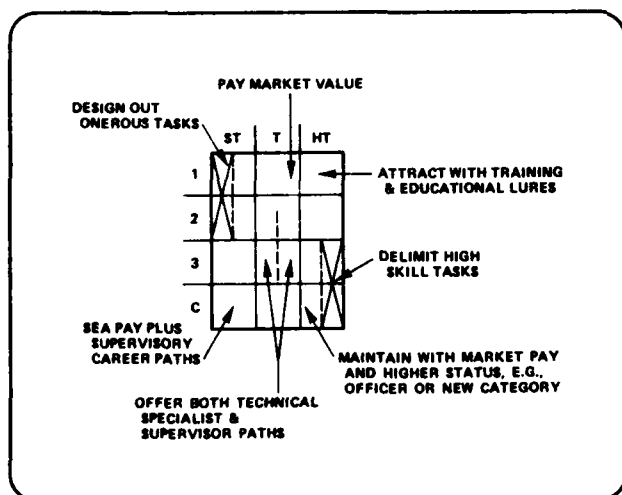
Regardless, the LRSP team used these rough analyses to produce a recommended strategy, including a recommended overall force structure. The strategy was not adopted, but its emphasis on an overall approach makes it a good illustration of an analytically based strategy. Four main points of this strategy are that the Navy should:

- Move toward 50/50 first-term-to-career mix.
- Realign ratings within skill groups.
- Reduce both high-skill and onerous low-skill tasks.
- Introduce different reward/compensation/career approaches for different skill groups.

The key is to recognize the constraints in the environment and focus skill groups differently.

The LRSP project developed a strategy focusing on term and technical classification. [SLIDE 5]

Slide 5



Looking at trends forecast for the '80s, it appears that it will be harder to find people to do some of the lower skilled jobs, although spaces on ships still have to be cleaned. Of course, the Navy has made progress in reducing some of the lower skilled requirements on some of the new ships, as you may have noticed on [SLIDE 4]. Secondly, for the high-technology groups, the research bears out

the hypothesis that you can attract them with better training and educational benefits--through a focused GI bill or just better training. To align skill groups better, it is probably necessary to separate pay from rank; then, an experienced petty officer supervising deck hands can have a higher rating (but less pay) than someone who can fix computers.

Some people want to be supervisors and some technicians. In designing technically skilled ratings, therefore, we need a flexible personnel policy that will accommodate both. From a manpower standpoint, this leads to a focusing of requirements. For the lower skilled areas, requirements should focus on groups of E-3s supervised by career E-5s or E-6s--who are kept in with sea pay and by serving as supervisors for 30 years if they wish. For the technically skilled, the key points are paying market value to attract them and maintaining an even mix of journeyman-level technicians and supervisors. In the higher skilled areas, people should be attracted with education and trained to journeyman-level skills as quickly as possible. Requirements planning should not depend on keeping many of them past 10 years.

This definitely would be a different approach. I'm not here necessarily to defend this but just to show the kinds of considerations I think should go into any strategy and the research and analysis necessary to make the trade-offs and design such a strategy.

The challenge I would pose is this: Do we think that the 1982 manpower numbers are what we will see throughout the rest of the '80s, or is 1978 more likely to be the model? If so, what should we be doing differently? Are there questions?

Question: You said part of your optimistic scenario was to get comparability with companies.

Answer: Private industry, right.

Question: Last year there were four bills in Congress redefining comparability as 94 percent of the pay and benefits of the private sector. Now, if something of that nature should become effective, would you change your optimistic scenario?

Answer: I defer all those questions to Cdr. Lee Mairs. The three scenarios are more just to see what may happen. It's clear that pay can be changed and is changed every year. If your best guess is that this will continue, you don't want to bank on Congress's not changing its mind and ending up with hardware you have to have but needing people you can no longer attract because pay has changed. Thank you.

# THE DEVELOPING MARKET FOR MILITARY MANPOWER: PROMISE

by

Dr. Lawrence Goldberg  
Economic Research Laboratory

## INTRODUCTION

Is this a good year for recruiting? The Air Force Times thinks it is a great year. [SLIDE 1] Indeed, these are relatively good times for recruiting, but times have not always been so good. [SLIDE 2]

In all the services, enlistment supply declined in 1977 and reached a low point in 1979. A recovery began in 1980, there was improvement in 1981, and 1982 will be a boom year. These fluctuations provide a golden opportunity to study enlistment supply: to measure the effects of supply factors and develop forecasting models. I have undertaken such a study and will tell you about it today.

We analyze enlistment supply in 1976-80. We do this to learn the lessons of history. Recruiting in the 1980s is likely to be determined by the same kinds of factors as those which influenced recruiting in the 1970s. Sure, the future will not be exactly like the past—it never is. Still, history repeats itself often enough for the study of history to be an essential input to the planning process. [SLIDE 3]

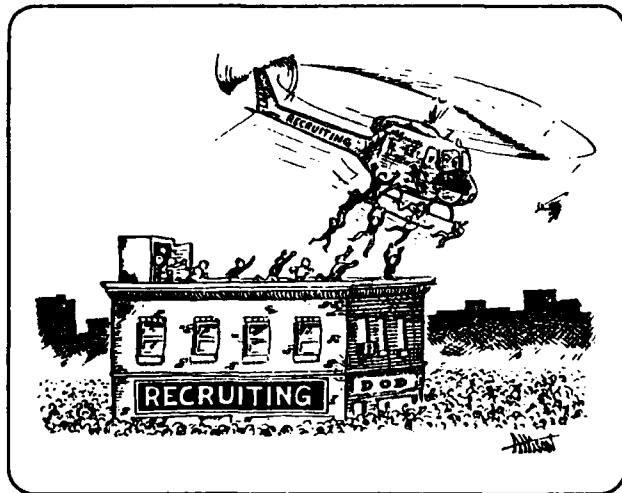
The study tries to answer three questions. Why did recruiting problems occur in the 1970s? Will there be enlistment shortfalls in the 1980s? What can be done to prevent shortfalls?

First, I will discuss the methodology briefly; next, the findings and how they relate to the study questions. Then, I will give conclusions and recommendations. [SLIDE 4]

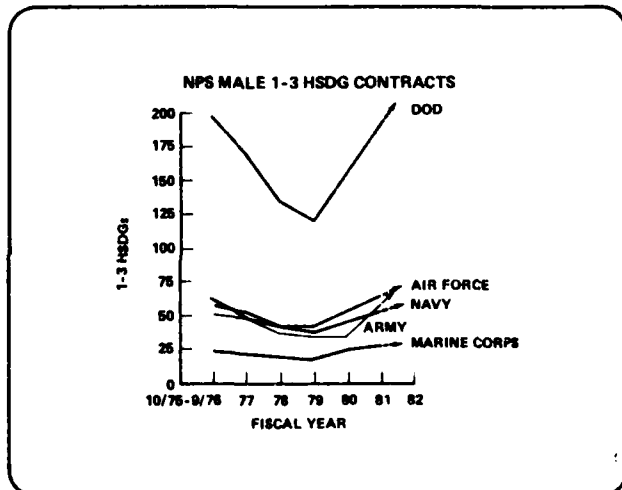
For recruiting purposes, the Navy divides the country into 43 geographic areas called recruiting districts. For each service, we analyze the supply of enlistments in these districts over the five-year period 1976-80. Our focus is on the enlistment cohort that is in short supply—male high-school graduates of above-average intelligence.

We assume that for each service the supply of these smart high-school graduates (HSGs) is affected by economic factors, demographic factors, and the number of recruiters assigned by each service. Regression analysis is used with annual data to estimate the effects that these factors have on enlistment

Slide 1



Slide 2



Slide 3

## STUDY QUESTIONS

- WHY WERE THERE RECRUITING DIFFICULTIES IN THE 1970s?
- WILL THERE BE ENLISTMENT SHORTFALLS IN THE 1980s?
- WHAT CAN BE DONE TO PREVENT SHORTFALLS?



supply, and to forecast the supply of enlistments in the 1980s. We have also done a separate analysis to estimate the effects of Navy advertising on Navy enlistment supply, but time limitations prevent me from discussing this analysis today. [SLIDE 5]

#### Slide 4

##### METHODOLOGY

- USED ANNUAL DATA FROM 43 NAVY RECRUITING DISTRICTS IN 1976-80
- ANALYZED SUPPLY OF SMART MALE HIGH SCHOOL GRADUATES
- ESTIMATED EFFECTS ON EACH SERVICE'S SUPPLY OF
  - ECONOMIC FACTORS
    - MILITARY PAY
    - UNEMPLOYMENT
    - FEDERAL YOUTH PROGRAMS (CETA AND STUDENT AID)
    - LOSS OF GI BILL IN 1977
  - DEMOGRAPHIC FACTORS
    - POPULATION
    - RACIAL MIX
  - RECRUITERS
    - NAVY
    - ARMY
    - AIR FORCE
    - MARINE CORPS
- FORECAST SUPPLY IN THE 1980s
- DID SEPARATE ANALYSIS OF THE EFFECT OF NAVY ADVERTISING ON NAVY ENLISTMENT SUPPLY

#### Slide 5

##### FINDINGS

- A SERVICE'S SUPPLY IS AFFECTED BY
  - MILITARY PAY
  - UNEMPLOYMENT
  - GI BILL BENEFITS
  - CETA PROGRAMS
  - RECRUITERS
  - POPULATION

The results are very similar across the services, which is remarkable and pretty exciting (at least for an analyst). With a few exceptions, enlistment supply for each service is affected by military pay, unemployment, GI Bill benefits, CETA programs, recruiters, and population. By and large, the magnitude of effects for individual supply factors seems quite reasonable, and the models forecast the improvements in recruiting in 1981-82 with a fair degree of accuracy. For these reasons we believe the model is a useful tool for policy analysis and forecasting. [SLIDE 6]

#### Slide 6

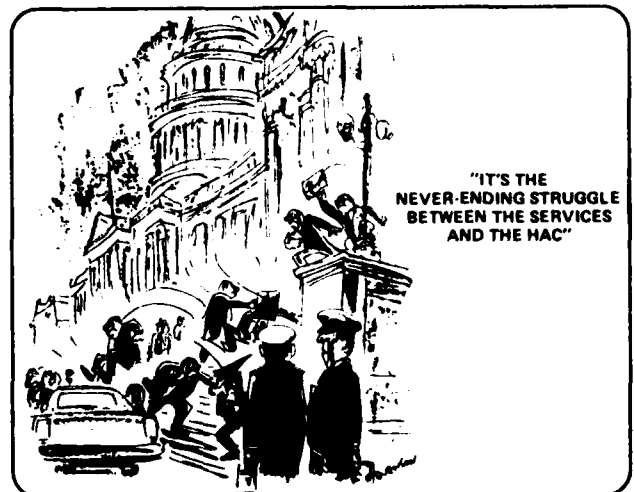
##### WHY DID RECRUITING PROBLEMS OCCUR IN THE 1970s?

- IMPROVEMENTS IN THE ECONOMY
  - INCREASES IN CIVILIAN WAGES
  - DECLINE IN UNEMPLOYMENT RATES
- GOVERNMENT POLICIES
  - CUTS IN GI BILL BENEFITS
  - CAPS ON MILITARY PAY
  - EXPANSION OF CETA PROGRAMS

Why did recruiting problems occur in the 1970s? A number of factors caused many potential enlistees to remain in the private sector. First, there was an upturn in the economy: civilian wages increased sharply and unemployment declined. In addition, there were adverse government policies: cuts in GI Bill benefits, caps on military pay, and increases in CETA programs. Between 1976 and 1978, these policies and the economy reduced the enlistment supply of HSGs by about 60 percent for the Army and about 30 percent for the other services. How could the services achieve their enlistment goals under such conditions?

To meet the recruiting problem, the Navy and the other services requested more recruiting resources, but the system was too slow in responding. [SLIDE 7]

#### Slide 7



"IT'S THE NEVER-ENDING STRUGGLE BETWEEN THE SERVICES AND THE HAC"

Serious shortfalls were experienced in FY 1978 yet additional recruiters were not assigned until FY 1980, and military pay was not increased until FY 1981.

How can we prevent shortfalls such as those we experienced in FY 1978? First, we must try to cancel the effects on recruiting of fluctuations in the economy. This can largely be done by having the military pay of enlistees grow at the same rate as the civilian earnings of youth. [SLIDE 8]

Slide 8

#### EFFECTS OF ECONOMIC CYCLE ON ENLISTMENT

	SUPPLY DECLINES (%)
RELATIVE MILITARY PAY DECLINES BY 9 PERCENT	12
UNEMPLOYMENT DECLINES BY 20 PERCENT	3
	15

Let me tell you why I believe this type of policy would work. During an upturn of the economy, such as we experienced in FY 1978, relative military pay declined by 9 percent and unemployment by 20 percent. Together, these two factors caused DoD enlistment supply to fall by about 15 percent. But most of the decline was caused by the failure of military pay to rise as quickly as civilian pay; the result was a 12 percent drop in supply, in contrast to the 3 percent decline caused by the drop in unemployment. The lesson to be learned here is that if military pay keeps up with civilian pay, cyclical fluctuations in enlistment supply can be substantially reduced.

Second, we must have more flexibility to quickly add resources that increase enlistments--GI Bill benefits, bonuses, and recruiters. But which type of resource yields the best return? [SLIDE 9]

It seems to be recruiters. We found that the old GI Bill provided a strong incentive for enlistment. But such a program is very costly. Any two-to-three billion-dollar GI Bill would generate HSGs, but at a cost that would probably exceed \$200,000 per enlistee

generated; enlistment bonuses, on the other hand, would cost only about \$23,000 per enlistee generated. For small expansions of supply, both these alternatives are expensive compared with recruiters. Navy recruiters, for example, could have increased the supply of HSGs in FY 1979 at a marginal cost of only about \$7,000 per enlistee generated. Why is it so much less expensive to use recruiters? The reason is that enlistment bonuses are paid to both the enlistees generated and those who would join anyway. Recruiters cost less because no additional payment is made to those who would join anyway.

Slide 9

#### MARGINAL COST PER 1-3A HSG IN FY-1979

	NAVY	DOD
GI BILL	\$ 200,000	\$ 200,000
BONUSES	27,800	23,000
RECRUITERS	7,000	3,500

Will the Navy experience shortfalls in the 1980s? Whether there will be shortfalls depends on a number of factors--the economy, government policies, and recruiting goals. Right now we are in a recession, and military pay has been rising faster than civilian earnings. CETA programs have been cut drastically, the recruiting force is relatively large, and recruiting goals are relatively low. Even if the economy turns up, we are not likely to experience shortfalls. But if the government stimulates the economy and cuts recruiters while goals are increased, we will have shortfalls. Let me show you how I reached these conclusions. [SLIDE 10]

We used the statistical results to forecast Navy enlistment supply in FY 1983-89. We assumed that military pay rises at the same rate as civilian earnings throughout the 1980s, that the overall rate of civilian unemployment remains at its average long-run level of 6.7 percent, that there is no new GI Bill for the Navy, that the services assign a few more recruiters than in FY 1980, and that the CETA program is cut severely. [SLIDE 11]

Slide 10

ASSUMPTIONS  
UNDERLYING FORECASTS OF SUPPLY

- MILITARY PAY GROWS AT THE SAME RATE AS CIVILIAN PAY
- UNEMPLOYMENT RATE AT LONG-RUN LEVEL (6.7%)
- NO GI BILL FOR THE NAVY
- INCREASES IN NUMBERS OF RECRUITERS
- DECLINES IN CETA PROGRAMS

What about the decline in population that everyone has been talking about? Won't this cause recruiting problems? No, if military pay keeps up with civilian pay. We found that population has a smaller effect than most people have thought, that recruiters seem to make up for declines in population by working a smaller population more intensively.

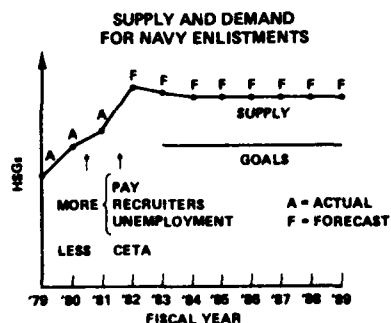
However, the smaller population pool in the late 1980s may cause relatively large increases in civilian earnings as employers compete for fewer people. But if the services compete by also raising wages, the smaller pool should not be a problem. [SLIDE 12]

Slide 12

CONCLUSIONS

- SERVICES NEED PERMANENT ECONOMIC SUPPORT
- SERVICES MUST BE ALLOWED TO RESPOND MORE QUICKLY TO CHANGES IN THE ECONOMY
- RECRUITING BUDGETS SHOULD BE RELATED TO THE GOVERNMENT'S ECONOMIC POLICIES

Slide 11



Under these assumptions, we forecast that, in FY 1983-89, Navy enlistment supply will increase by about 33 percent over the figure for FY 1980. Why? Because of increases in relative military pay and recruiters, and declines in CETA programs. The supply is now considerably greater than in FY 1980 because of these factors and because of increases in unemployment.

For FY 1983-87, the Navy has recruiting goals for high-quality personnel that are just about equal to the level of supply in FY 1980. Supply should have increased considerably over FY 1980 levels--and it has. Given our assumptions regarding the level of supply factors, the Navy should be able to meet its recruiting goals.

For recruiting to be successful, the services need a permanent commitment regarding military pay and benefits. Because such a commitment was lacking and other adverse government policies were in effect, recruiting problems in the 1970s were severe. Such a commitment is needed to prevent shortfalls caused by economic upturns and population declines.

The services need more flexibility to adjust to changes in the economy. The budgeting process must be speeded up. We can't wait two to three years for resources.

Recruiting budgets must be increased when government policies increase employment opportunities in the private sector. Recruiting has not determined--and should not determine--economic policies. But the administration should be made aware that economic policies affect recruiting. If the government stimulates the economy, it should provide the services with more recruiting resources.

[SLIDE 13] A permanent commitment requires that military pay keep up with civilian pay. To do this we recommend tying the military pay of enlistees to the civilian earnings of youth on a year-to-year basis. This will dampen the effects of economic cycles and meet the competition for enlistees in the late 1980s caused by population declines.

We also recommend adjusting the Navy's recruiting budget and enlistment bonus program to the unemployment rate and the level of CETA programs. If these policies are adopted and recruiting goals for enlistees are not increased, the Navy should achieve these goals in the 1980s.

Slide 13

#### RECOMMENDATIONS

- TIE MILITARY PAY TO CIVILIAN EARNINGS OF YOUTH
- TIE RECRUITING RESOURCES AND BONUS PROGRAMS TO UNEMPLOYMENT AND CETA PROGRAMS

## THE DEVELOPING MARKET FOR MILITARY MANPOWER: PROSPECTS

by

Dr. George F. Brown, Jr.  
*Data Resources, Inc.*

I appreciate the opportunity to join you today and discuss the labor market of the 1980s and some of the problems and prospects which will affect military manpower decisions.

When I talked with Stan about this conference, he suggested that one of his objectives was to look at the environment over the next 25 years in order to identify what kind of research ought to be done in the next decade or so to give the Navy a solid basis for planning.

That stimulated me to start off by looking at the environment of 25 years ago, to give us all a proper perspective on the amount of uncertainty we're really dealing with. Let me just read very quickly a couple of economic headlines from 1957 that a good solid planner should have been able to translate into today's environment and its implications:

On January 16, President Eisenhower proposed a record \$71.8 billion government budget. In order to balance the budget, he refused to cut taxes.

On March 7, Saudi Arabia called for a better deal on profits from U.S. oil companies. The Saudi director general of petroleum declared, "We are going to get what we are entitled to, sooner or later. We want it to be on friendly terms."

On July 1, the government ended the fiscal year with a budget surplus of \$1 billion, the second surplus in a row.

And, on November 15, industrial production fell 2 points to the lowest level in 16 months. Under fears of recession, the Federal Reserve cut the discount rate by half a percentage point, down to 3 percent.

So, I think we ought to all realize that this group of assembled economists, planners, and others has some very serious problems confronting it in terms of defining what the environment will look like over the next 25 years.

I have a couple of general conclusions that I'd like to reach about how the next decade will unfold and the prospects that will leave us with. Let me begin by stating them, and then I'll try to come back and suggest some of the bases for those conclusions.

First of all, the period that we're in at present, the one we just concluded over the last couple of years, and the one over the next several years, are in many senses an anomaly and are different from the environment we will be facing during the rest of the 1980s.

Second, I think that many of the environmental factors that are changing will make DoD recruiting a more difficult task.

Third, I think that retention of skilled personnel is going to become particularly difficult during the 1980s and, to no small extent, that difficulty will be the result of DoD's own weapon procurement programs.

And, fourth, I think that the problem of maintaining pay comparability is going to be complicated over the 1980s and that the present projections of inflation rates and military pay increases will severely understate those likely to be occurring throughout the rest of the economy. Those are the four general comments that I think ought to be central in planning discussions.

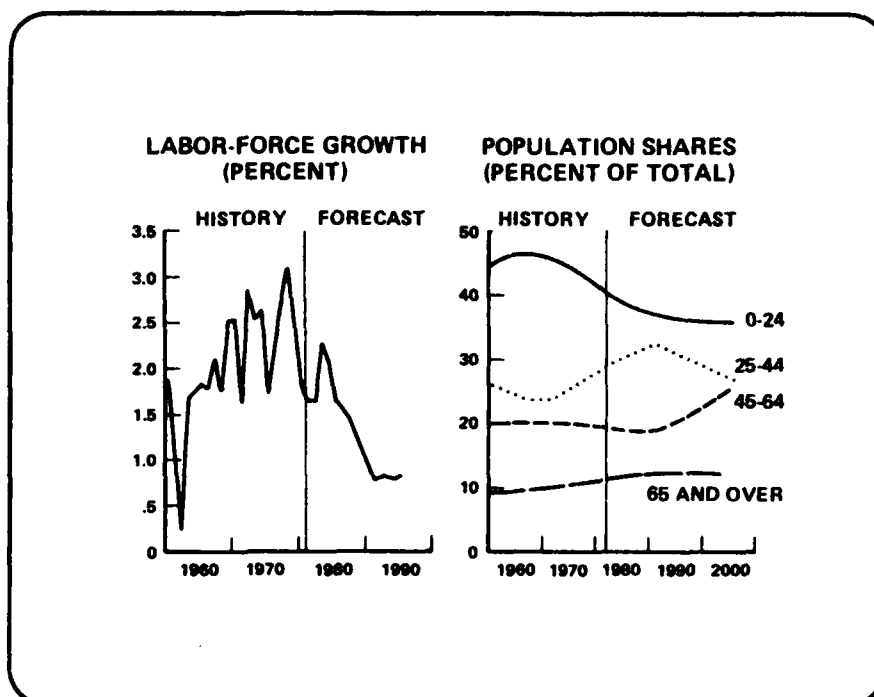
First of all, it is useful to examine some of the structural changes that affect the labor force in terms of demographics and that will be translated into today's and tomorrow's impacts on recruitment and retention. Several of the speakers this morning have already noted that the economy could not be doing much more for DoD recruiting than it's done in the last few years. We have had significant downturns in economic growth and significant growth in unemployment rates, at the same time that we've been near the peak in terms of the labor pools in which DoD has recruited.

The teenage unemployment rate in 1981 was 19.4 percent. In 1982, it will probably just exceed 22 percent for the year as a whole. Next year it will probably drop back to only about 19 percent, but during the rest of the decade there will be significant improvement. This rate will probably drop to around 15 percent by the end of the 1980s. That improvement--a reduction of roughly a quarter in teenage unemployment--will have an adverse impact on the pool from which DoD can recruit.

You see the situation even more dramatically and more quickly when you look at the 20-to-24-year-old age group. Last year that group had a nationwide unemployment rate of about 12.3 percent. It will peak at just over 15 percent for 1982 and drop under 13 percent next year. By 1985, that group's unemployment rate will drop below 11 percent--an improvement of roughly a third in the prospects of that group within a period of 3 1/2 years.

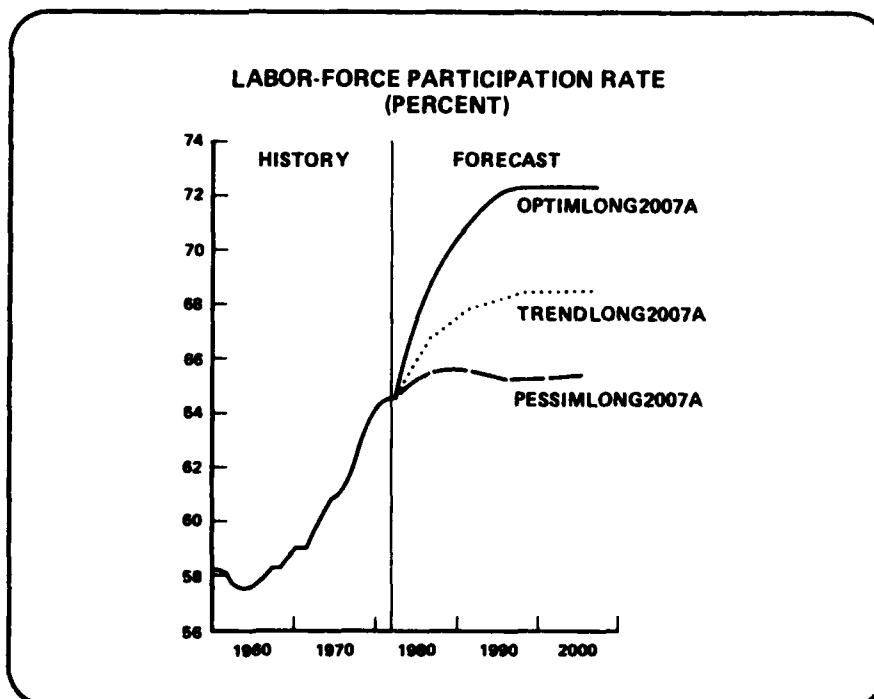
Not only are things changing dramatically in terms of employment rates, but the size of the pool itself has changed. In the decade from 1960 to 1970, 33 million men turned 18. Between 1970 and 1980, 41 million turned 18. In 1980 alone, there were something like 4.2 million new 18-years-olds, and that number will decline steadily, with an average annual decrease of about 2 percentage points for the rest of this decade. By 1990, the number of new 18-years-olds will be about 3.2 million, only about three-quarters as many as there were last year. [SLIDE 1] suggests some of those structural changes in terms of the labor force and of the shares of the population within various age groups.

Slide 1



Several other factors will also have an important bearing during the 1980s. One of these has been the changes in labor force participation rates that we witnessed during the 1960s and 1970s. [SLIDE 2] shows some history of labor force participation rates, followed by some alternative scenarios of how those labor force participation rates might evolve in the '80s and beyond. Obviously, there have been many structural changes in the recent historical period, the largest being the significant increase in female participation in the labor force. It still remains well below the male rate, but the question is still unsettled as to how these rates will change in the next 20 to 25 years.

Slide 2



[SLIDE 3] shows some of those scenarios in terms of some key economic parameters and compares them with averages recorded over the past 25 years. You see in some of these key variables fairly wide fluctuations as a function of the different scenarios that are treated there. The average inflation rate under a pessimistic scenario could remain at almost 9 percent for another 2 1/2 decades. Under a much more optimistic scenario, it

could drop back to a rate similar to the ones we've experienced historically. In terms of unemployment, we could see an improvement over our present situation, or, under a much more pessimistic scenario, we could see persistently high unemployment rates. The labor

force participation rates will have an important bearing on the particular markets that DoD attempts to attract.

Also relevant to planning is the near-term economic situation and the way it is likely to unfold as we get later into the 1980s. [SLIDE 4] summarizes several of the most frequently observed measures of economic performance: GNP growth, unemployment, inflation, and interest rates. The 1980-1982 period has been unusually bad from an overall economic perspective. In 2 of the last 3 years, we've seen actual declines in real GNP. We have seen unemployment go from the mid-5-to-6-percent range of the late 1970s up to where it will reach over 10 percent this year. We have seen inflation, which has grown steadily over the '70s, jump up toward the double-digit range in the last couple of years before declining during the current recession, and we've seen interest rates soar.

Now, when we look out into the future, the conclusions include both good and bad elements. Relative to the 1980-1982 period, the rest of the decade looks much better for the U.S. economy. Relative to a longer period of history, things don't look nearly so rosy. You can see that under these alternative scenarios presented there, GNP growth, after turning negative this year, is likely to improve in 1983 and then remain reasonably strong over the next few years. As a consequence, unemployment will drop, gradually and consistently, from its present peak. At the same time, the recession will reduce significantly longer-term inflation prospects, yielding an improvement of a couple of percentage points in the key inflation measures, as we look out into the middle 1980s.

The implications of this are several. First of all, although some of the speakers

Slide 3

#### SOME KEY ECONOMIC PARAMETERS, PAST AND FUTURE (PERCENT)

	1956-81	TREND 1982-2007	CYCLE 1982-2007	OPTIM 1982-2007	PESSIM 1982-2007
AVG. REAL GNP GROWTH	3.3	2.5	2.3	3.0	2.1
AVG. INFLATION (GNP DEFLATOR)	4.6	6.1	7.3	4.4	8.7
AVG. UNEMPLOYMENT	5.6	6.8	7.3	6.4	7.0
AVG. LABOR-FORCE GROWTH	2.0	1.1	1.1	1.3	0.9
AVG. PRODUCTIVITY GROWTH	1.8	1.7	1.5	1.9	1.4
AVG. INDUSTRIAL PRODUCTION GROWTH	3.7	3.2	2.8	3.7	2.6
AVG. FUEL IMPORT BILL (PERCENT OF GNP)	1.0	2.8	3.1	2.7	3.1
AVG. TAX BURDEN (PERCENT OF GNP)	29.4	31.6	31.7	30.8	32.0
AVG. FIXED INVESTMENT (PERCENT OF GNP)	10.3	12.5	12.0	13.4	11.9

GROWTH RATES FOR THE PROJECTION PERIOD ARE COMPOUNDED ANNUAL GROWTH RATES CALCULATED BETWEEN THE YEARS 1981 AND 2007. LEVEL AVERAGES ARE FOR THE YEARS 1982 TO 2007.

Slide 4

#### PROJECTIONS UNDER THREE ALTERNATIVE ECONOMIC SCENARIOS

	1982	1983	1984	1985	1986	1987
REAL GROSS NATIONAL PRODUCT (ANNUAL RATE OF CHANGE (%))						
ROBUST	-1.7	2.2	4.5	4.4	4.2	4.0
BASE	-1.7	2.1	3.8	3.5	3.7	3.5
SLUGGISH	-1.7	2.1	3.0	3.1	3.5	3.3
GNP DEFLATOR (ANNUAL RATE OF CHANGE (%))						
ROBUST	6.0	5.2	5.7	6.2	6.3	6.3
BASE	6.0	5.2	5.7	6.1	6.1	6.0
SLUGGISH	6.0	5.2	5.6	6.0	5.9	5.8
WHOLESALE PRICE INDEX (ANNUAL RATE OF CHANGE (%))						
ROBUST	2.0	3.5	6.9	7.7	7.2	6.6
BASE	2.0	3.5	6.7	7.2	6.6	5.9
SLUGGISH	2.0	3.5	6.6	6.9	6.3	5.6
INDUSTRIAL PRODUCTION INDEX (ANNUAL RATE OF CHANGE (%))						
ROBUST	-7.9	2.5	8.2	6.5	5.6	5.3
BASE	-7.9	2.1	6.7	4.7	4.9	4.2
SLUGGISH	-7.9	2.1	4.9	4.1	4.5	3.9
UNEMPLOYMENT RATE (%)						
ROBUST	9.7	10.1	8.9	7.9	7.2	6.6
BASE	9.7	10.1	9.1	8.5	7.9	7.5
SLUGGISH	9.7	10.1	9.3	8.9	8.5	8.0
CAPACITY UTILIZATION RATE - MANUFACTURING (%)						
ROBUST	70.0	70.7	75.5	78.9	81.3	83.1
BASE	70.0	70.4	74.1	76.3	78.3	79.5
SLUGGISH	70.0	70.4	72.8	74.6	76.4	77.4
90-DAY TREASURY BILL YIELD (%)						
ROBUST	10.5	8.5	8.6	9.3	9.7	9.2
BASE	10.5	8.4	8.4	9.0	9.4	8.9
SLUGGISH	10.5	8.4	8.3	8.9	9.3	8.8
FEDERAL DEFICIT (BILLIONS OF DOLLARS)						
ROBUST	143.8	180.0	183.1	159.1	157.8	139.1
BASE	143.8	181.7	173.1	182.8	191.6	186.7
SLUGGISH	143.8	186.3	182.7	200.1	214.7	215.8

have raised questions about the weight of the impact of unemployment on military recruiting, the direction of impact is clear: The labor markets are going to make it much tighter, and there are going to be fewer available people on whom the services can draw. At the same

time, when you look at the inflation projections in the table, you see that the inflation rates, while coming down from the recent levels, remain in the 7 percent range over the next several years. That is also a reasonably consistent estimate of what will be the likely changes in wage income throughout the economy. An average change of 7 percent in wage income is considerably more than has been proposed in the DoD budgets, and I think we'll see some real pressure for maintaining comparability between military and civilian employment opportunities at the same time that the number of civilian employment opportunities is beginning to increase.

A second factor that will place pressure on the maintenance of comparability between military and civilian pay could result from the inflation estimates included in the DoD budget. To the extent that the Administration continues to be committed to force modernization programs, over-optimism regarding inflation will increase pressure on the elements of the budget that can be changed most in the short run--primarily, military pay and operations and maintenance expenditures. Such inflation gaps between budgeted and likely costs of programs and the general problems associated with Federal deficits will combine to put fairly severe pressures on the goal of maintaining pay comparability, which was earlier advanced as a principal objective if DoD is to meet its recruiting and retention goals in the 1980s.

That Defense production will become an important industrial force during this decade after a long period of declining importance is readily apparent from an examination of summary statistics relating to the industrial outlook for the period 1982-87. The 10.2 percent average annual growth rate for total private non-agricultural Defense output projected to result from the implementation of the current DoD spending plans is well above the 3.6 percent overall growth rate projected for non-agricultural production. The growth rates for Defense output from the construction, transportation, and utilities, services, trade, and non-durables manufacturing sectors, within which Defense shares of output are quite modest, are all nearly three times larger than the projected non-Defense growth rates. Within the durables manufacturing sectors where the Defense share is projected to rise from 9.6 percent during 1982's recession to 12.6 percent in 1987, the influence of Defense spending is even more dramatic: Over 20 percent of the growth in durables output between today and 1987 will result from additional production for Defense. The subsectors

of durables manufacturing within which Defense-induced growth will be a major portion of overall growth include fabricated metal products, primary metals, transportation equipment, electrical machinery, and instruments and parts.

Such growth, of course, has large employment implications, to be discussed shortly. These employment implications will complicate significantly both the recruiting and--probably more important--the retention prospects for DoD during the 1980s because it has been traditionally true that many of these industries have viewed DoD military personnel as one of the prime labor pools from which they themselves can recruit. To the extent DoD is successful in attracting and training a skilled labor force, it will to a greater extent have a valuable pool of employees that might be turned toward helping the private sector to meet projected output growth rates.

These large impacts on the composition of production will be accompanied by similar strong influences on the labor markets of the 1980s. [SLIDE 5] shows projections of the impacts of Defense spending plans on the level and composition of employment over the 1982-1987 period. Along with estimates of employment in those 2 years, with the Defense component of employment shown as well as total employment, the table displays projections of the average annual rate of growth and of the Defense "share" of the new jobs projected to be created over this period. The 8.2 percent growth rate projected for Defense employment is far above the 1.6 percent overall employment growth rate projected for the private non-agricultural sectors of the U.S. economy. Differentials of this general magnitude exist across all of the sectors which contribute non-trivial levels of output for Defense.

In terms of the concerns of this conference, these projections are important not only because of the possible pressures on recruitment and retention, but also because of the health of the Defense industrial base itself. DoD manpower planners are likely to have to pay more attention to the extent to which key Defense-supplying industries can man their factories and production lines. Employment and occupation forecasts are thus important from both uniformed and industrial perspectives.

Continuation of the current Defense buildup would result in 1.17 million additional jobs by 1987 in industries producing directly or indirectly for the Defense



end-market. These 1.17 million additional jobs represent 15.7 percent of the employment growth projected over this period, taking into account changes in the composition of spending (on Defense and elsewhere) and the productivity increases projected across these various sectors of the economy.

Even if reductions in Defense spending are subsequently imposed and the 1.6 percent overall employment growth rate is increased through additional fiscal stimuli (e.g., jobs bills, tax cut acceleration, etc.), the conclusion that Defense-supplying sectors will be among the major net new employers of the 1980s remains unchanged. For example, if Defense spending were reduced as recommended by Congress this fall, 13 percent of the net jobs would still be associated with Defense production, and the number of net new jobs associated with Defense production would remain about 1 million.

In the durables manufacturing sector, the additional 610,000 jobs required for Defense production by 1987 will represent an actual majority of the new positions to be created in this period. Unlike the recent past, when durables employment has grown more sluggishly than has employment elsewhere (e.g., at the 1.1 percent average annual rate between 1977 and 1981), the 1.9 percent average annual growth rate projected for these sectors will exceed the economy-wide average. The additional jobs in durables manufacturing resulting from the increased levels of Defense spending will be largely concentrated within the transportation equipment and electrical machinery subsectors.

While, to date, most attention has focused on the challenge of expanding plant and equipment sufficiently to accommodate increased levels of Defense demands without creating bottlenecks, these projections of growth in the labor force necessary for Defense production will be no less significant in determining the end result. Given the levels of technical skill necessary for most categories of Defense production, the lead times for recruiting and training can often be as large as those for acquiring and installing physical capital.

Slide 5

DEFENSE INTERINDUSTRY FORECASTING SYSTEM  
EMPLOYMENT FORECAST SUMMARY  
(MILLIONS OF PEOPLE EXCEPT AS NOTED)

	1982		1987		AVERAGE ANNUAL % GROWTH		DEFENSE SHARE OF GROWTH (%)
	DEFENSE	TOTAL	DEFENSE	TOTAL	DEFENSE	TOTAL	
TOTAL NONAGRICULTURAL EMPLOYMENT	2.41	90.34	3.58	97.76	8.20	1.59	15.7
CONSTRUCTION	0.20	6.11	0.30	6.47	8.78	1.14	29.0
FINANCE, INSURANCE & REAL ESTATE	0.05	5.52	0.08	6.03	8.94	1.79	5.7
MINING	0.02	0.67	0.03	0.72	7.46	1.36	22.1
TRANSPORTATION & UTILITIES	0.17	4.72	0.22	5.02	5.28	1.23	16.6
SERVICES	0.55	25.19	0.81	28.06	6.23	2.19	9.2
WHOLESALE & RETAIL TRADE	0.10	14.08	0.16	15.13	9.47	1.45	5.4
FEDERAL GOVERNMENT	NC	2.74	NC	3.15	NC	2.89	NC
STATE & LOCAL GOVERNMENT	NC	13.04	NC	13.86	NC	1.22	NC
MANUFACTURING	1.32	18.27	1.97	19.32	8.34	1.12	62.1
NONDURABLE GOODS	0.11	7.25	0.15	7.20	7.16	-0.12	NM
FOOD & PRODUCTS	0.01	1.74	0.01	1.72	5.13	-0.20	NM
TOBACCO PRODUCTS	0.00	0.06	0.00	0.06	7.24	-0.80	NM
TEXTILES & PRODUCTS	0.01	0.55	0.01	0.58	5.39	1.00	7.5
APPAREL & PRODUCTS	0.01	1.40	0.01	1.21	5.36	-2.92	NM
PAPER & PRODUCTS	0.01	0.65	0.02	0.68	7.45	0.75	21.8
CHEMICALS & PRODUCTS	0.03	1.03	0.04	1.09	7.64	1.15	20.9
PRINTING & PUBLISHING	0.01	0.71	0.01	0.71	6.01	0.18	58.4
PETROLEUM PRODUCTS	0.01	0.22	0.01	0.22	5.28	0.16	145.1
RUBBER & PLASTIC PRODUCTS	0.02	0.67	0.03	0.73	10.33	1.66	20.9
LEATHER & PRODUCTS	0.00	0.22	0.00	0.21	5.51	-0.95	NM
DURABLE GOODS	1.21	11.03	1.82	12.12	8.44	1.91	55.5
LUMBER & WOOD PRODUCTS	0.01	0.59	0.02	0.67	9.17	2.56	8.0
FURNITURE & FIXTURES	0.00	0.45	0.01	0.49	4.28	1.41	3.1
STONE, CLAY, & GLASS	0.02	0.59	0.03	0.61	8.91	0.77	38.2
PRIMARY METAL INDUSTRIES	0.07	1.06	0.11	1.10	8.39	0.63	105.5
FABRICATED METAL PRODUCTS	0.12	1.52	0.19	1.62	8.33	1.28	81.4
HOMELECTRICAL MACHINERY	0.09	2.18	0.13	2.38	8.33	1.75	22.3
ELECTRICAL MACHINERY	0.37	2.00	0.57	2.31	9.02	2.92	64.9
TRANSPORTATION EQUIPMENT	0.47	1.70	0.69	1.92	8.08	2.45	102.0
INSTRUMENTS & PARTS	0.06	0.54	0.07	0.61	8.37	2.52	33.5
MISCELLANEOUS MANUFACTURING	0.00	0.39	0.01	0.42	6.07	1.27	5.2

SOURCE: DATA RESOURCES, INC.

[SLIDE 6] provides estimates of the demands likely to be imposed upon the labor markets by 1987 for a number of occupational groupings particularly relevant to Defense production. The majority of the additional workforce required to meet the Defense production levels discussed above will be drawn from these occupational groupings. Along with estimates of employment for Defense and in total for 1982 and 1987, the table shows average annual growth rates and the 1987 Defense "shares," with the latter displayed both in terms of total 1987 employment and in terms of the net growth between 1982 and 1987. These final two columns of the table illustrate once again the significant role which Defense is likely to play in the labor markets of this decade. Though the overall Defense share of employment exceeds 15 percent for only a few narrowly defined occupational specialties, the Defense share of the 1982-87 net growth exceeds 15 percent for all but a few of the occupational groupings. For such diverse occupations as engineers and operatives, about one out of each three new positions created by 1987 will be associated with Defense production.

Though the short-term prospects for filling jobs related to Defense production are strong as a result of the slack in today's economy, the longer-term view includes several potential problems. First among these is the health of the education and training establishments. Public financing of education and

training has recently been under severe pressure as a result of budgetary concerns, both at the Federal and at the state and local levels. At the same time, private financing of such activities has been impacted by the general economic climate, while corporate investment has been impacted by the combination of reduced business profits and the absence of near-term requirements for additional workers.

The military services themselves have long served as an important source of education and training for personnel within many of the occupational specialties noted in Slide 6. But they are unlikely to be able alone to fill these gaps elsewhere, given the services' increased requirements for retention of skilled personnel to operate the weapon systems now being procured. There may, in fact, be direct competition for these skilled personnel as a result of DoD's own acquisition programs. To meet the growth requirements within many of these occupations and avoid labor-induced bottlenecks, these problems will have to be overcome.

#### DISCUSSION

**Question:** What you are saying is that, in the '80s, we're going to have higher unemployment than in the '70s.

**Answer:** That's correct. However, an important change is the number of people who were in the military during the early 1970s and who are projected to be in the military during the 1980s. The gap can be explained by the draw-down in end-strength following Vietnam. So that's an important determinant of the relatively low rates we saw in the late '60s and early '70s.

**Question:** Is what you're talking about an unemployment rate that is not lower than what we saw in the '70s?

**Answer:** We're talking about an unemployment rate in the 1980s which steadily comes down over that period to a level which is higher than it was in the early '70s, about the same as it was in the '77-to-'78 period, and considerably lower than it's been in the '79-'82 period. It's also important to remember

Slide 6

#### DEFENSE INTERINDUSTRY FORECASTING SYSTEM EMPLOYMENT FORECASTS FOR SELECTED OCCUPATIONS FORECAST OF EMPLOYMENT BY OCCUPATION (THOUSANDS OF PEOPLE, EXCEPT AS NOTED)

	1982		1987		AVERAGE ANNUAL % GROWTH		1987 DEFENSE SHARES (%)	
	DEFENSE	TOTAL	DEFENSE	TOTAL	DEFENSE	TOTAL	TOTAL	NET GROWTH
ENGINEERS	129	1,150	196	1,346	8.8	3.0	14.6	36.9
AERO-ASTRONAUTIC ENGINEERS	28	68	47	91	10.7	8.0	51.5	81.7
ELECTRICAL ENGINEERS	41	325	62	398	8.9	3.9	15.7	31.4
SCIENTISTS, NEC	9	304	12	334	7.1	1.9	3.6	11.6
ENGINEERING & SCIENCE TECHNICIANS	68	1,252	100	1,417	8.0	2.5	7.1	19.4
ELECTRICAL & ELECTRONIC TECHNICIANS	28	368	42	419	8.6	3.2	10.0	23.2
TECHNICIANS, NEC	10	280	14	303	8.2	1.6	4.6	15.7
COMPUTER SPECIALISTS	19	459	31	582	10.9	4.9	5.4	10.2
SOCIAL SCIENTISTS & OTHER PROFESSIONALS	150	9,492	200	10,086	5.9	1.2	2.0	8.4
BUSINESS PROFESSIONALS & STAFF	671	34,816	927	37,686	6.7	1.6	2.5	9.0
CRAFT & RELATED WORKERS	437	11,906	597	12,896	6.4	1.3	4.7	20.2
CONSTRUCTION CRAFTS WORKERS	104	3,218	141	3,406	6.3	1.1	4.1	18.6
MECHANICS, REPAIRERS & INSTALLERS	95	3,879	131	4,218	6.6	1.7	3.1	10.6
METALWORKING CRAFT WORKERS EXCLUDING MECHANICS	61	963	84	911	6.6	1.1	9.2	47.3
OPERATIVES	587	13,408	813	14,161	6.7	1.0	5.7	32.6
ASSEMBLERS	172	1,532	246	1,719	7.5	2.3	14.4	40.3
METAL WORKING OPERATIVES	125	1,508	174	1,622	6.9	1.6	10.7	42.5
SERVICE WORKERS	227	15,627	323	17,024	7.3	1.7	1.9	6.8
LABORERS, EXCEPT FARM	141	5,667	199	5,963	5.9	1.1	3.2	15.4

SOURCE: DATA RESOURCES, INC.

that that unemployment rate is applied to a significantly smaller base than the base we have looked at at any time between 1960 and the present. The right statistic to focus on is the number of unemployed teenagers. The number of unemployed teenagers is going to fall steadily through the 1980s and be lower by a lot than it was at any time during the 1970s.

**Question:** I noticed that even your pessimistic figures show a positive growth rate of GNP. Could there be no real growth during this period?

**Answer:** Well, the evidence we see does not suggest that as a realistic degree of pessimism. The low numbers there look at something like 2 1/2 percent real GNP growth, which is dramatically worse than anything we've experienced over a sustained period of time in this century. That's a big drop--probably a percentage point per year--from the last 25 years. So the projection is for a far less robust economy, but not a stagnant economy.

**Question:** What's the reason behind that big drop?

**Answer:** One of the important ones is in fact the drop in the labor force. In terms of looking at the post-World War II period, almost two-thirds of the growth in potential GNP--what the economy can produce at full utilization of resources--is explained by labor force

growth. Labor force growth is going to be far less under any scenario for the rest of the entry than it has been in the post-World War II period. That will put a significant damper on the possible rate of expansion of GNP. There are some other factors that contribute to that. The 1970s were not a particularly good decade for either capital investment or R&D spending, although there has been some recent improvement in R&D spending. That affects the capital elements of the supply side of the economy. Energy over the last 25 years has been a nearly free resource. It's become much less so, and that will also contribute to hindering the potential growth in GNP. So, it really is a combination of all the principal factor inputs, but in terms of relative importance the labor force growth rates are going to have the biggest negative impact, and that changes the outlook considerably.

*Question:* I have the impression that over the '70s, the labor force participation of women increased. Initially, many had little experience. Perhaps this contributed to the fall in productivity over the period. Now that their attachment has become more permanent, can we expect productivity to rise?

*Answer:* Productivity--output per worker--appears to be better explained by investment in capital stock than can be explained by the demographic characteristics of the labor force. I think what you said is correct but not the principal influence.

*Question:* What is the effect of basic technological changes, as people are replaced by robots and all that sort of thing? How does that affect this forecast?

*Answer:* That, first of all, is an element which is difficult to assess because we have very limited experience; there's not too much basis for historical econometric projections. We have looked at the introduction of capital and the capital influence on productivity on an industry-by-industry basis and tried to project how the mix of industrial activity affects this. There are some positive results from that, and some of the highest growth sectors across the economy are the ones producing that kind of equipment.

*Question:* The employment growth rates seem low relative to the growth in the DoD budget. Why?

*Answer:* Growth rates in good years have been between 3 and 4 percent for the economy. In recent years, 3 percent's been good growth; we're projecting overall growth of under 3 percent over the next couple of decades so that some of these numbers are projecting average annual growth over twice the rate that the overall economy is going to grow. So, I consider that healthy growth. Secondly, these are employment projections. In many of these industries, for any industry where you have positive growth rate for productivity, the industry is going to grow at a more rapid rate than employment is going to grow. On the output side, growth rates are typically larger--for example, 10 percent in the semiconductor industry, 7 percent in the aircraft industry. It's thus a combination of employment and labor productivity that must be related to overall industry growth rates. Can these be accommodated? I think the answer is probably yes, but significant investment and significant new employment and worker training are implied by those growth rates.

*Question:* What do these projections imply for fiscal policy?

*Answer:* The conclusions suggest many of the benefits that the Reaganomics advocates suggested will in fact begin to happen during the mid-1980s. The stimulus to investment, an improvement in inflation, and continued GNP growth are all elements of their projection. There are some elements that, I think, remain troubling, however. The deficit is projected to remain above \$100 billion dollars almost as long as we project. Real interest rates are projected to remain fairly high. That will have a dampening effect, particularly on the construction markets and new home building. Fortunately, the combination of the Economic Recovery Act provision of tax benefits for businesses and the end-market growth that we're projecting allows a fairly significant amount of business fixed investment to occur later in the decade. The 1981 tax bill significantly lessens the impact of these high interest rates on investment capital, once capacity utilization rises.

# SETTING DEFENSE MANPOWER REQUIREMENTS FOR THE 1980s

by

The Honorable David S.C. Chu  
Director, Program Analysis and Evaluation  
Office of the Secretary of Defense

It's a pleasure to address this evening the "requirements" issue, a badly neglected part of our manpower research agenda.

There are, I believe, two reasons for this neglect. [SLIDE 1] First, as John Warner's paper acknowledges, it is analytically much tougher than supply questions. Supply questions are well defined; they draw on a considerable body of academic work (particularly from the economics literature); and there is a good analytical framework from which to approach them. We can estimate equations; we can report upon them with satisfaction; and we can argue among ourselves whose equation is best.

That is not true for the requirements side. Even if we did have a good analytical structure, there is very little data with which to estimate it. Nor, unfortunately, is much work going on to add to the data bases available to us.

The second reason for our neglect may be revealed in the very word "requirements." It suggests there is a fixed point, or need, well known to all, that must be achieved at any cost. It implies that we know what we want and that there is no room for debate about alternative solutions or substitutions.

## Why Should We Worry About Requirements?

While it's obvious to many in this audience, let me stress for the record why I think it's important to look at the requirements

Slide 1

## THE "MILITARY MANPOWER ANALYSIS BOOM" OF THE LAST 15 YEARS HAS LARGELY NEGLECTED REQUIREMENTS

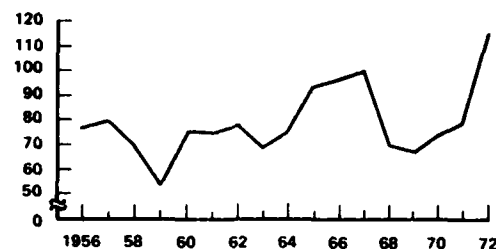
- AS JOHN WARNER'S PAPER ACKNOWLEDGES, "DEMAND" IS AN ANALYTICALLY TOUGHER SUBJECT THAN "SUPPLY"
  - THERE ARE SEVERE MEASUREMENT PROBLEMS
  - AND FEW USEFUL DATA BASES
- BUT THE VERY WORD "REQUIREMENTS" REFLECTS THE LIMITATIONS OF OUR EFFORTS
  - "REQUIREMENTS" IMPLIES THE "NEEDS" ARE WELL KNOWN AND WELL DEFINED
  - AND THAT THERE IS NO ROOM FOR SUBSTITUTION OR ALTERNATIVE APPROACHES

Slide 2

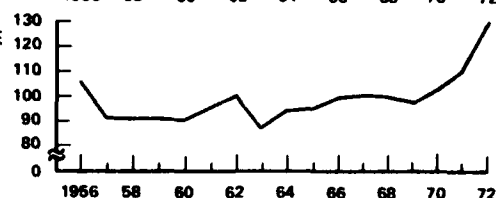
## WHY SHOULD WE WORRY ABOUT REQUIREMENTS? WITH THE ALL-VOLUNTEER FORCE, JUNIOR MANPOWER COSTS ROSE RELATIVE TO EQUIPMENT COSTS:

INDEXES OF THE COST OF LABOR RELATIVE TO THE COST OF CAPITAL (1967 = 100)

A. CALCULATED USING OBSERVED COSTS



B. CALCULATED USING THE AVERAGE PEACETIME RATE OF DEPRECIATION (9.3%)



SOURCE: RICHARD V. L. COOPER AND CHARLES R. ROLL, JR., THE ALLOCATION OF MILITARY RESOURCES, RAND CORPORATION, P-5036-1 (MAY 1974), P. 22.

issue. There are a number of important factors that argue in favor of doing so. One of the most compelling is the historic change in the costs faced by the Department of Defense following the advent of the all-volunteer force in the early 1970s.

Costs for junior enlisted personnel rose relative to the cost of other resources that we need—in particular, relative to the cost of capital. [SLIDE 2] draws on the work of Rick Cooper and Bob Roll, when they were on the Rand staff some years ago. As you can see, there was a rather considerable shift in relative costs, especially if you smooth out the year-to-year variations.

There have been some adjustments to these changes. [SLIDE 3] Over the last several years, the Army increased the proportion of senior personnel in its force. The portion of the active enlisted force with more than 4 years of service rose from just under 40 percent to a projected level of 44 percent in FY 1983. Overall, however, the adjustments have not been as dramatic as you might think, given all the changes that have occurred.

What Does the U.S. Navy Experience Tell Us About Trends in Manpower Requirements?

In the next few slides I'd like to use the United States Navy as a source of examples for the relationships of interest to us. The Navy's experience is not necessarily different from that of the other military services, but it may be of special interest to this audience.

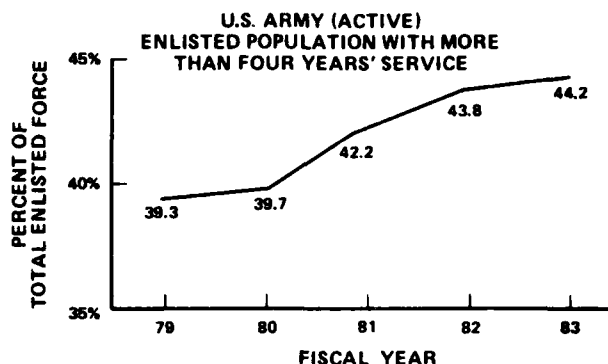
As we know, the U.S. armed forces in general (and the Navy in particular) have shrunk in size over the last 15 years. But the number of people per (conventional force) ship has actually increased over this period. [Slide 4].

Now, we would all agree that a ship is a rather crude measure of a unit of capital. A

Slide 3

### SOME ADJUSTMENTS HAVE BEEN MADE

THE ARMY HAS INCREASED THE PROPORTION OF MORE SENIOR PERSONNEL IN ITS ENLISTED FORCE FOR THE LAST SEVERAL YEARS:

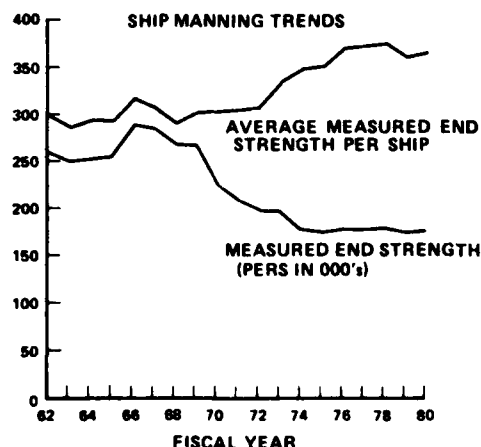


SOURCE: DoD FORCE READINESS REPORT, VOLUME III: PERSONNEL AND TRAINING (APRIL 1982) P. 9.

Slide 4

### BUT THE MILITARY DEPARTMENTS ARE NOT NECESSARILY REDUCING THEIR OVERALL MANPOWER REQUIREMENTS RELATIVE TO EQUIPMENT LEVELS

IN THE NAVY, AVERAGE END STRENGTH PER DEPLOYABLE BATTLE FORCE SHIP ACTUALLY ROSE IN THE 1970s (ALTHOUGH TOTAL NAVY MANPOWER FELL AS THE FLEET SHRANK).



SOURCE: OFFICE OF THE DIRECTOR, PROGRAM ANALYSIS AND EVALUATION, OFFICE OF THE SECRETARY OF DEFENSE

lot of changes have taken place in ships in recent years. In particular, they have gotten bigger on average, and so it might be instructive to look at what happens if we correct for the capability changes that have occurred.

These would be best measured by evaluating the physical capital we have, but we don't possess such a data series. Therefore, we have simply measured "people per pound" of ship displacement.\* [SLIDE 5]

Although manning relative to ship capabilities (at least as measured by weight) declined slightly before the advent of the all-volunteer force, it has remained relatively constant since the early 1970s.

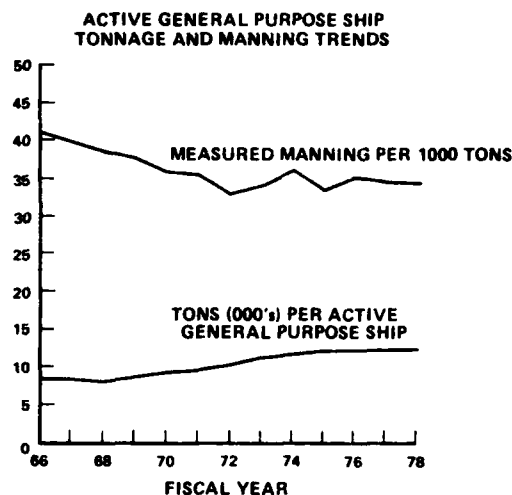
There is a historical explanation for this phenomenon. In the late 1960s and early 1970s, the Navy was retiring a large number of ships, presumably of World War II vintage. These were relatively small, but also relatively manpower-intensive units. Since that one-time shift, there has been no real change—at least as far as we can easily track.

Let us turn now from ships to aircraft. In contrast to overall ship-related manpower, aircraft-related personnel strength in the Navy has not changed (although there was a brief bulge during the Vietnam years). [SLIDE 6] If you look at people per airplane—again, a very simple measure—you see a rather substantial upward trend, tapering off by the early 1970s. We frankly do not understand this trend, but it tends to justify the fears of those who feel that it's taking more and more people to support our front-line forces, and who question whether that is an affordable trend.

Like ships, aircraft have changed in capabilities over this period, so it is necessary to make some adjustment

Slide 5

MANPOWER PER SHIP IS A POOR MEASURE, BECAUSE SHIPS HAVE BEEN INCREASING IN SIZE. BUT MANNING PER 1000 TONS IN THE DEPLOYABLE BATTLE FLEET SHOWS NO CHANGE IN THE 1970s (ALTHOUGH THERE WAS SOME EARLIER DECLINE, AS THE NAVY RETIRED OLDER, MANPOWER-INTENSIVE SHIPS).

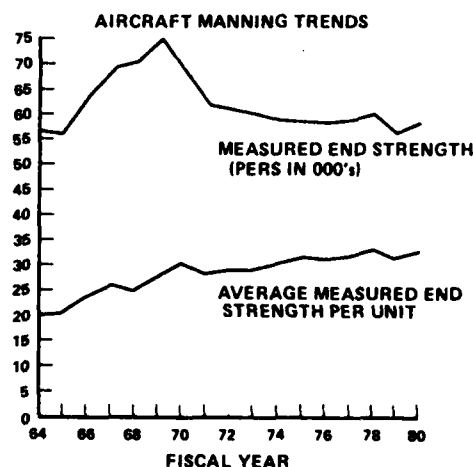


SOURCE: OFFICE OF THE DIRECTOR, PROGRAM ANALYSIS AND EVALUATION, OFFICE OF THE SECRETARY OF DEFENSE

Slide 6

#### THERE IS LIKEWISE NO DECLINE IN MANPOWER PER NAVY AIRCRAFT

IN FACT, THERE WAS A SIGNIFICANT INCREASE IN THE YEARS BEFORE THE ALL-VOLUNTEER FORCE.



SOURCE: OFFICE OF THE DIRECTOR, PROGRAM ANALYSIS AND EVALUATION, OFFICE OF THE SECRETARY OF DEFENSE

\* This is the kind of simple measure that PA&E is often criticized for offering, and let me stipulate that I recognize the criticism. I urge the critics to propose better measures!

for these changes. While I apologize for simply weighing aircraft, cost relationships for aircraft are based on the weight of the airplane, among other factors (thrust, inlet temperatures, etc.).

Our analysis of aircraft-related manpower yields somewhat different results from what we found for ships. When you adjust in this very crude fashion, manpower requirements have actually fallen over this period: "people per pound" has declined. [SLIDE 7]

Part of the explanation may be that in Slide 7 we're considering only active attack and fighter squadrons. Those are constrained by an important factor: They have to fit on the aircraft carrier! So there is a limit on how many people you can have. If we added the readiness groups, which comprise the remainder of conventional force aircraft, I'm not sure that we would get the same result.

#### In What Requirements Issues Should We Be Interested?

It is indicative of the paucity of work on requirements that we don't have much better measures than "people per pound," or some other relatively unsophisticated approach. Let me, therefore, spend a few moments trying to articulate some of the most important issues in this area, and outline how we might try to improve the present situation.

I recognize there is a whole host of issues we might consider. I'd like to pose two broad ones. [SLIDE 8]

The first concerns the individual characteristics that we desire in our military force. I think there are a number of subquestions that we might usefully ask:

- While we've set standards in this area for some time (for entry and

Slide 7

#### BUT AIRCRAFT HAVE BECOME MORE CAPABLE PER UNIT

- WHILE THERE IS NO GOOD OVERALL "CAPABILITY ADJUSTMENT," WEIGHT PROVIDES A FIRST APPROXIMATION
- IN FY68, THE AVERAGE OPERATIONAL ACTIVE ATTACK/FIGHTER AIRCRAFT WEIGHED 31,700 POUNDS, AND THE ATTACK/FIGHTER SQUADRON PROGRAM ELEMENTS PROVIDED 19.9 PEOPLE PER AIRCRAFT
- IN FY80, THE AVERAGE OPERATIONAL ACTIVE ATTACK/FIGHTER AIRCRAFT WEIGHED 43,900 POUNDS, AND THE ATTACK/FIGHTER SQUADRON PROGRAM ELEMENTS PROVIDED 23.6 PER AIRCRAFT.
- THUS IN FY68, WE HAD 6.3 PER 10,000 POUNDS OF AIRCRAFT; IN FY80, 5.4.

Slide 8

#### IN WHAT REQUIREMENTS ISSUES SHOULD WE BE INTERESTED?

- WHAT *INDIVIDUAL* CHARACTERISTICS DO WE WANT IN OUR PEOPLE?
  - HOW DO THESE CONTRIBUTE TO THEIR ON-THE-JOB PERFORMANCE?
  - SHOULD THEY HAVE THESE AT ENTRY, OR SHOULD THEY BE ACQUIRED IN THE MILITARY? IN THE FIRST TERM OR LATER?
  - HOW DO THESE CHARACTERISTICS AFFECT *UNIT* PERFORMANCE?
  - WHAT IS THE VALUE OF FLEXIBILITY TO UNIT PERFORMANCE? HOW IS IT ACHIEVED? HOW MUCH IS "OPTIMAL"?
- HOW MANY PEOPLE WITH THESE CHARACTERISTICS WOULD WE LIKE? *WHERE AND HOW* WOULD WE WANT TO USE THEM?
  - WHAT ARE THE BENEFITS OF "MORE"? OF "LESS"? CAN WE MEASURE THESE IN TERMS THAT ARE MEANINGFUL TO SENIOR DECISION-MAKERS (E.G., READINESS)?
  - TO WHAT EXTENT SHOULD WE RELY ON ACTIVE PERSONNEL vs. RESERVES? ON MILITARY PERSONNEL vs. "CIVILIANS"? ON DIRECT-HIRE EMPLOYEES vs. "CONTRACTORS"?
  - HOW SHOULD WE USE THE VARIOUS POLICY INSTRUMENTS AT OUR DISPOSAL TO ACHIEVE OUR MANPOWER GOALS?

retention, for example), do we know the relationship between these characteristics and actual on-the-job performance? We have, of course, "war stories" on these points. We have a

considerable body of literature on the relationship between training performance at entry and these kinds of characteristics. But we have much less knowledge of the relationship between these characteristics and on-the-job performance. We do know a good deal about how some of those characteristics predict retention, which is one measure of performance. But we don't know much else.

- To what extent should the individual possess these characteristics at entry? Or should they be acquired during military service? We have typically resolved this issue by insisting on only a very few personal characteristics at entry, and deciding that we'll teach the recruit everything he or she needs to know. This goes beyond the specific issue of "lateral entry," and includes broader questions of how and when we provide training: Should we do it early in a career, or later? Are the current arrangements the best that we might contemplate?
- To what extent do individual characteristics affect unit performance? It may be very important for a unit to have a mix of characteristics different from what you would desire if you look only at individual performance. In fact, Army leaders have argued quite persuasively for a new G.I. bill on this basis, contending that it is necessary to have individuals with a certain motivation and social characteristics, not so much for specific jobs but to make the unit more flexible, better able to absorb combat losses of its leaders. Here again, however, we are relying on casual empiricism to support this particular proposition. It would be very nice to have more than that.

The second major issue is obvious: After you've identified particular characteristics and their contributions, how many people of these types do we need and, specifically, where and how would we want to use them?

The military is an extremely diverse organization with many different kinds of responsibilities. The Air Force has a very different set of "requirements" than does the Army or the Navy. Even within the services, the kinds of operations vary. It is ironic that in one of the world's largest

organizations--where flexibility should be easiest--we tend to insist on uniformity, particularly in recruit characteristics.

To answer the questions "How many? Of what kind?" we need to know the specific benefits of increasing the characteristics judged to be of value, as well as the loss associated with having fewer of those characteristics. This returns us to my initial point: It is unfortunate that we speak of manpower "requirements," suggesting there is very little room for debate about whether we might change our goals. In practice, we do change them--and often decide not to meet them--as pay scales change relative to opportunities in the civilian sector, and as budgets change relative to the missions our forces must be prepared to carry out. The Army, for example, varies how much of the force it actually mans (as has the Marine Corps), "zeroing out" entire units from time to time, even though these are still carried on the books as "required."

We need to go beyond the simple measures of "x percent of the requirements on hand." That does not tell those responsible for resource allocation how good or how bad they should feel regarding the outcome. What does it mean to say that the average Army battalion is "95 percent manned?" Is it just as desirable to go from 90 percent to 95 percent manned, as from 95 percent to 100 percent? Is it better to have more battalions manned at 95 percent or fewer at 100 percent? We make decisions on these points all the time--if only implicitly--but all too often our judgments have not been informed by much thoughtful analytic work.

In answering the questions "How many? Of what kind?" we also need to ask how much we should rely on active-duty, as opposed to reserve, personnel to fill our needs. (That may require some redefinition of what we mean by "reserves.")

Similarly, to what extent should we rely on people wearing uniforms (whom we call "military") versus people we call "civilians"? (In fact, we use civilians to man a number of key military activities.)

A further related question is whether we ought to hire the people ourselves or contract for them with the private sector. Often a contractor is able to fill specialized needs better than our line organizations can. We have seen such a trend in the maintenance area, for example, for some highly specialized equipment. Does that mean we are ready to have contract personnel be close to the "front line"? We know very little about how well



these kinds of arrangements might work, although much speculation is offered when decisions must be made.

A final issue is how we can best use the various policy tools we have at hand to recruit individuals with the particular characteristics we desire. Obviously, the answers to the previous questions are not independent of how easy it is for us to recruit the kinds of people we want. While I don't mean to limit the debate to compensation, one factor is the direct monetary cost.

Simply to illustrate the importance of asking these questions, let me cite a Rand Corporation study by Mark Albrecht, based on a survey of Air Force supervisors. The supervisors were asked to assess the output of people with different amounts of experience. Their evaluations were used to estimate "optimal" manning by experience level for various Air Force skills.

The study concentrated on the proper proportion of first-term personnel, defined as those with less than four years of service. Two of the study's results are especially interesting. First, the "optimal" proportion was clearly not the same for every skill area, ranging from a low of about 35 percent in some of the more "difficult" areas (electronic communications equipment repairmen, for example) to a high of 83 percent for fuel specialists. [SLIDE 9] Second, the proportions actually observed in the late 1970s, when the study was undertaken, were generally not different from the "optimal" levels.

What is distressing is that the Air Force personnel plan proposed moving opposite to Rand's recommendations. [SLIDE 10] The plan proposed raising very substantially the first-term content of the force, responding to

Slide 9

#### WHAT KINDS OF PEOPLE MUST WE HAVE TO OPERATE FUTURE EQUIPMENT?

- A RECENT RAND STUDY POINTS TO ONE WAY OF ANSWERING THIS QUESTION. IT LOOKS AT THE "OPTIMAL" MIX OF LESS EXPERIENCED (FIRST TERM) AND MORE SENIOR ("CAREER") PERSONNEL FOR A SERIES OF AIR FORCE SKILL AREAS.
- ITS RESULTS CONFORM TO WHAT INTUITION WOULD SUGGEST. IN GENERAL, CURRENT AIR FORCE MANNING FOLLOWS THE STUDY'S RECOMMENDATIONS, BUT THERE ARE SOME NOTABLE EXCEPTIONS.

#### SUPPLY CONSTRAINED MODEL AND COMPOSITE RESULTS

AFSC	DESCRIPTION	CURRENT FORCE			IMPLIED EFFICIENT FORCE			AVERAGE MARGINAL CAREER COSTS
		PERCENT FIRST TERM	FIRST TERM	CAREER	PERCENT FIRST TERM	FIRST TERM	CAREER	
326X0	AVIONICS AEROSPACE GROUND EQUIPMENT SPECIALIST	53.7	570	480	48.0	487	522	18614
326X1	INTEGRATED AVIONIC COMPONENT SPECIALIST	57.6	1023	752	41.0	628	925	19600
326X2	INTEGRATED AVIONIC SYSTEMS SPECIALIST	57.5	1210	895	49.0	960	987	19700
304X4	GROUND RADIO REPAIRMAN	44.2	2834	3572	40.0	2482	3714	18278
706X0	ELECTRONIC COMMUNICATIONS EQUIPMENT REPAIRMAN	40.5	1000	1472	36.0	885	1562	19105
421X3	AEROSPACE GROUND EQUIPMENT REPAIRMAN	58.6	4228	2989	35.0	2186	3880	19803
422X1	AIRCRAFT ENVIRONMENTAL SYSTEMS REPAIRMAN	56.1	1141	892	55.0	1084	845	-
431X1	AIRCRAFT MAINTENANCE SPECIALIST	48.3	21331	22828	45.0	19301	23861	-
542X0	ELECTRICIAN	46.2	836	907	52.0	914	858	-
543X0	ELECTRICAL POWER PRODUCTION SPECIALIST	48.3	1423	1537	48.0	1425	1545	-
571X0	FIRE PROTECTION SPECIALIST	62.0	3899	2385	44.0	2427	3148	19200
622X0	COOK	41.1	1724	2473	60.0	2766	1803	-
631X0	FUELS SPECIALIST	38.4	2348	3786	83.0	6076	1257	-
647X0	MATERIALS FACILITY SPECIALIST	48.6	4049	4278	48.0	3987	4310	-
671X3	ACCOUNTING SPECIALIST	57.4	1733	1637	66.0	2453	1175	-
902X0	HOSPITAL CORPSMAN	59.8	4430	2980	59.0	4300	2988	-
981X0	DENTAL SPECIALIST	65.0	1430	755	64.0	1367	780	-

SOURCE: MARK J. ALBRECHT, LABOR SUBSTITUTION IN THE MILITARY ENVIRONMENT, RAND CORPORATION, REPORT R-2330-MR&L (NOVEMBER 1979), P. 67.

Slide 10

PERHAPS MORE SERIOUS - UNDERSCORING THE IMPORTANCE OF ASKING WHAT KINDS OF PEOPLE WE NEED - THE AIR FORCE'S FUTURE PERSONNEL GOAL (ITS "OBJECTIVE FORCE") MOVES IN THE OPPOSITE DIRECTION FROM RAND'S RECOMMENDATIONS. CLEARLY, HERE IS AN IMPORTANT SUBJECT FOR ANALYSIS AND DEBATE.

#### OBJECTIVE FORCE AND IMPLIED EFFICIENT FORCE

AFSC	DESCRIPTION	PERCENT FIRST TERM	FIRST TERM	CAREER	PERCENT FIRST TERM	FIRST TERM	CAREER
326X0	AVIONICS AEROSPACE GROUND EQUIPMENT SPECIALIST	62	3080	1914	48	487	522
326X1	INTEGRATED AVIONIC COMPONENT SPECIALIST	62	3080	1914	41	628	925
326X2	INTEGRATED AVIONIC SYSTEMS SPECIALIST	62	3080	1914	49	980	987
304X4	GROUND RADIO REPAIRMAN	56	7176	5726	40	2482	3714
706X0	ELECTRONIC COMMUNICATIONS EQUIPMENT REPAIRMAN	68	3519	1654	36	885	1562
421X3	AEROSPACE GROUND EQUIPMENT REPAIRMAN	67	13764	8549	36	2186	3880
422X1	AIRCRAFT ENVIRONMENTAL SYSTEMS REPAIRMAN	67	13764	8549	55	1084	845
431X1	AIRCRAFT MAINTENANCE SPECIALIST	60	29145	19202	45	19301	23861
542X0	ELECTRICIAN	68	1894	895	52	914	858
543X0	ELECTRICAL POWER PRODUCTION SPECIALIST	73	2210	840	48	1425	1545
571X0	FIRE PROTECTION SPECIALIST	78	5271	1444	44	2427	3148
622X0	COOK	71	3876	1631	60	2766	1803
631X0	FUELS SPECIALIST	79	5679	1528	83	6076	1257
647X0	MATERIALS FACILITY SPECIALIST	66	18278	10051	48	3987	4310
671X0	ACCOUNTING SPECIALIST	83	3737	2189	66	2453	1175
902X0	HOSPITAL CORPSMAN	66	8684	4542	59	4300	2988
981X1	DENTAL SPECIALIST	67	1884	906	64	1367	780

SOURCE: ALBRECHT, P. 71.

\*THIS AFSC IS THE SOLE MEMBER OF THE CAREER PROGRESSION GROUP, OR THE PREDOMINANT OCCUPATION IN THE CGP.

personnel management considerations, rather than to conclusions about what kind of people were really needed in the force. I don't know whether the Air Force ever implemented its plan, but the study does illustrate the

importance of trying to answer the kinds of questions we've been discussing this evening.

Slide 11

Let me wrap up briefly. [SLIDE 11] As we look over the next several years--at the defense goals we are trying to achieve and the resource levels that are likely to be available--we cannot ignore these manpower requirements issues. They need to be debated. They need good analysis.

I've tried to list a few issues of great concern, on which basic work--answering fundamental questions--would be very helpful. As I have tried to suggest, there is a great deal to do, because what we have done to date is relatively modest. There is considerable challenge here for the manpower analysis community. I urge you to respond to it.

I've tried to list a few issues of great concern, on which basic work--answering fundamental questions--would be very helpful. As I have tried to suggest, there is a great deal

## CONCLUSIONS

- WE CANNOT IGNORE THE "REQUIREMENTS" ISSUE AND STILL ACHIEVE AN EFFECTIVE DEFENSE PROGRAM WITH THE RESOURCES AT OUR DISPOSAL
- ANALYSIS CAN CONTRIBUTE TO CLARIFYING THE ISSUE
- BUT ONLY A MODEST EFFORT HAS BEEN MADE TO DATE

to do, because what we have done to date is relatively modest. There is considerable challenge here for the manpower analysis community. I urge you to respond to it.

**SESSION II**  
**REPORTS OF WORKSHOPS**

## REPORT OF WORKSHOP: REQUIREMENTS

by

Dr. Thomas Blanco\*  
*Naval Personnel Research and  
Development Center*

### Session Overview

To meet the manpower requirements stated by the Navy, analysts have focused a great deal of attention on issues of supply: accession and retention policies and predictions. In these analyses, the requirements themselves are fixed. As a result, demand-related issues have largely been ignored.

Accordingly, workshop members raised a wide range of basic issues that require attention. Key issues were these:

- What overall commitment is expected of the Navy, both present and expanded?
- What is the purpose of the Navy's manpower requirements?
- What mix of people would best enable the Navy to meet its commitments?

The workshop began with a description of present policies for determining requirements. From the discussion that followed, the key issues emerged.

### Current Policy

Manpower requirements are computed under three separate programs corresponding to the prescribed mission of shore, ship, and squadron activities. The programs produce three sets of documents that, together, constitute the Navy's total manpower requirement. These manpower documents are commonly referred to as "SHMDs," "SMDs," and "SQMDs" for shore, ship, and squadron activities, respectively. Though the programs may differ in detail, they are consistent in fundamental approach.

Industrial engineers disaggregate each individual activity and then each required mission into tasks that must be performed as part of that mission. Once these tasks are identified, the time needed for each is measured by survey teams in a large sample of activities. This process provides statistical confidence in the measure. The time needed per task is multiplied by the number of tasks per period. The result is the number of man-hours

required per activity. Conversion from man-hours to manpower requirements is based on the length of the work-week. Because the work-week is shorter on shore than aboard ship, a given amount of work requires more manpower at a shore activity; on the other hand, tasks often differ between the two environments.

A draft document, by activity, results from this industrial engineering effort. The draft is then distributed for review and comment. Disagreements are resolved by Op-11, and a final statement of requirements is issued.

Requirements are the Navy's assessment of its own needs for manpower. Requirements are thus synonymous with "billets." Congress generally approves funding for only a portion of total billets. Funded billets are commonly referred to as "authorizations." Authorizations need not—and generally do not—match inventory, day by day. Wherever possible, personnel are distributed to authorized billets that match their own ratings and Navy Enlisted Classifications (NECs). Authorized billets may also be filled by personnel who differ in paygrade and NEC from those specified in the manpower document.

### Purpose of Requirements

Workshop members agreed that the present procedure provides excellent documentation of manpower requirements, given today's organizational structure, mission, and method of carrying out the mission. The procedure thus provides the Navy with an important service: justification for the Navy's manpower budget request to Congress. Because efficiency is so hard to gauge in the absence of a market where, for instance, profits separate efficient firms from wasteful ones, justification of manpower requirements is important.

As should be clear from the preceding discussion, however, present methodology is weak if one wishes to explore alternatives to the present organizational structure or to vary the mix of personnel requirements as relative wages change. Indeed, one cannot even be sure that an efficient mix is being used at current relative costs of inputs, since costs play no part in determining requirements. This uncertainty represents a fundamental weakness in the present approach.

### Achieving Desired Output

Although some research is underway, more is needed before the Navy can respond to

\* Assisted by Ms. Linda C. Cavalluzzo of CNA.

relative wage changes in a cost-effective way, while still carrying out its mission. Issues that must be addressed include:

- Labor-labor substitutability: Is the output of one E-9 comparable to that of two E-7s, for instance? And can the same tradeoff be made across ratings, or do substitution possibilities differ by rating? Similarly, what LOS, educational, and mental ability trade-offs can be made?
- Research reported to the working group suggests that a richer mix of personnel may be cost-effective. This finding needs further verification. Before a valid assessment of substitution possibilities can be made, however, good output measures must be identified.
- Capital-labor substitutability: What kinds of tradeoffs can be made between personnel and equipment? What mix is efficient? Members of the working group noted that the efficient capital-labor ratio on ships may differ from the efficient mix ashore. This is so, for example, because of pay and work-week differentials between sea duty and shore duty. It was further noted that the capital-labor ratio that is efficient in peacetime may not be efficient during a war.
- The efficacy of up-or-out policies for both enlisted personnel and officers: The possibility of creating separate tracks for technical specialists was discussed. The group felt that this policy holds potential benefits for the Navy but that advancement in either system should be encouraged.
- Readiness measures: Working group members believe that new readiness measures or a revamped UnitRep system should be made more sensitive to changes in readiness. Improvements in measures of readiness would aid in assessments, not only of substitutability, but also of losses in readiness associated with variations in the authorization rate.

Finally, improvements in the computation of manpower required for wartime activity may be warranted. Present methods estimate the total man-hours of corrective maintenance required at the expected operating tempo of wartime. The additional maintenance man-hours are then apportioned to various work-centers

in proportion to their peacetime contribution to total corrective maintenance. Recent research indicates, however, that subsystems--engines versus electronics, for instance--respond differently to surge flying conditions. Validation of these results would support estimating man-hour requirements by work unit code to make sure that carriers are manned with the right mix of expertise. Therefore:

- The effect of surge flying conditions on corrective maintenance man-hours should be analyzed by work unit code.

It was also noted that wartime tasks are likely to differ from peacetime tasks. Over time, special wartime ratings and NECs have been subsumed into peacetime ratings. The members of the working group were therefore uncertain of manpower preparedness for wartime tasks, such as better repair of damage.

- The quantity and quality of personnel allocated to wartime tasks in the manpower documents should be examined for adequacy.

#### Sea-Shore Rotation

The shore establishment, a necessary component of the fleet, acts in a wide range of areas. These include: coordination of the movement of personnel, material, and ships; maintenance; recruiting and training; and the testing and evaluation of new weapon systems. Though some of these activities must be carried out by the military for security or other reasons, many shore activities can be performed by either civilian or military personnel.

The civilian-military mix in the shore establishment is determined, in large measure, by the desire to maintain a "reasonable" sea-shore rotation cycle. The recent introduction of sea pay suggests that the sea-shore rotation cycle is more flexible than was previously believed. Sea pay seems to mitigate the problem of attrition associated with sea duty.

If flexibility is to be added to the sea-shore rotation cycle, the military-civilian mix at shore activities should be reevaluated. The Navy may wish to move more of its authorized billets to sea-duty activities. Such a strategy should improve the level of readiness at the Navy's deployed activities. In this connection, several research issues present themselves:

- What sea pay is optimal? Ideally, the amount should be just enough to

outweigh the preference for shore duty over sea duty.

- What is the optimal civilian-military mix at shore activities? This is mainly a problem of cost tradeoffs, but mobilization plans may also be important.
- How should general billets be distributed across warfare communities for optimal sea-shore rotation cycles by community?

#### Linking Shore Manpower to Fleet Output

Another issue, more basic than the mix of personnel at shore establishments, is the contribution that the shore establishment makes to fleet performance. Here, the shore activities themselves are at issue.

Though shore billets are important to support of the fleet--the members of the working group were in agreement on this--the actual value of this support is often hard to demonstrate. As a consequence, Congress has often made cuts in base operating support (BOS).

The working group believes that research is needed to establish the link between support-activity manpower, the output it produces or function it performs, and the ability of the fleet to carry out its mission.

Discussion centered on setting requirements at the present level of activity. Many members of the workshop, however, argued that total requirements depend directly on the mission planned for the Navy. Should requirements planners look only at billets within an activity or take a broader approach and

consider research to justify the activities themselves? There was consensus that strategic planning and manpower requirements are closely linked and that several issues should be considered:

- Will the 600-ship Navy mean reductions from present activity levels for ships and crews, or will the mission expand in proportion?
- Should ships be fully manned for a "come-as-you-are" conflict, or can the Navy man more ships at reduced levels and depend on mobilization to meet wartime needs?
- What geographic coverage should the Navy plan for? Should the U.S. react to the Soviets' moves or make them react to the U.S.?

In the process of determining requirements, detailed models prescribing requirements at the individual billet level are developed. Several members of the group noted that it is important to relate these models to aggregate force models. It was felt that it is necessary to develop macro-aggregate force support models based on requirements for use in the POM and EPA. These models should translate detailed Navy requirements into requirements by Defense Planning and Programming categories to enable the Navy to talk to Congress and justify total manpower requirements--officer, enlisted, and civilian--including structured requirements (operational and support) and non-structured requirements (students and TP&P, that is transients, patients, and prisoners). These models should be able to operate quickly (preferably interactively) to allow for short-term analysis of proposed changes in manpower levels during the annual POM process.

## REPORT OF WORKSHOP: ACCESSION

by

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U.S. Naval Postgraduate School

The focus of the workshop was on the accessioning of non-prior-service males; the remainder of this discussion, with few exceptions, reflects that. Participants in the workshop were asked about:

- Accession policy debates that could be illuminated by research and development
- Promising research and development efforts that could be used to advantage by the Navy's Recruiting Command.

The resultant comments have been organized under three issue areas:

- How does the Navy get recruits?
- Whom should the Navy recruit, and how many?
- How do we reduce the demand for accessions?

The remarks are organized in outline form within each of the three issue areas.

### HOW DO WE GET THEM?

Within this section the comments are organized under two subtopics: Supply Models and Recruiting Effectiveness.

#### Supply Models

- There is general agreement about the variables that enter as predictors in enlistment supply models. These predictors include measures of unemployment, numbers of recruiters, advertising outlays, the G.I. Bill, eligible population, and military pay relative to civilian pay.
- There is concern about how accurately the coefficients in the models estimate the effects of some predictors, e.g., the number of recruiters and the level of unemployment.

- We may not be doing a good job of estimating the effect of unemployment on supply because unemployment is not measured very well. Perhaps we should use employment data instead.
- Our measurement of the effects of recruiters is made less precise because the Recruiting Command selects and assigns recruiters with effectiveness as a goal.
- The results of the Wharton experiment suggest that recruiters are important, advertising (when effective) is very effective, and the usual estimates of the effects of G.I. Bill benefits are too high, and of unemployment, too low.
- More work should be done to examine the responsiveness of enlistment contracts to nonpecuniary rewards, such as educational benefits.
- The enlistment supply modeling by the Gates Commission has continued to look quite good. Additional work is needed, however, on the effects of pay, bonuses, recruiters, and advertising on enlistment supply.
- The relation of enlistment supply to other governmental programs--e.g., college loans and youth employment programs--should be better established. The effects of other services' recruiting on Navy recruiting should also be elucidated.
- The services require a variety of enlistment supply models. Some effects are estimated better by time-series models, others by cross-sectional models, still others by mixed models.
- Enlistment supply models need to be made less aggregate, so that supplies of enlistees can be forecast for separate occupations.
- Supply models should be developed for special groups, e.g., for individuals who majored in science in high school, or for "older" non-prior-service males, prior-service personnel, community-college students, and women. Supply models should also be developed for some individual mental groups.

\* Assisted by Dr. G. Thomas Sicilia of the Office of the Assistant Secretary of Defense (MRA&L).

- The relationship of advertising to recruiting leads should be better understood.
- The next large improvement in supply modeling should and could come from using mixed-time-series and cross-sectional data with externally developed variables. These variables would be manipulated through experiments.
- Obtaining enough officers of specific backgrounds, e.g., engineering and science, is difficult. The pool should be identified and sized.
- An answer should be found to the question: What are the effects of the status of the civilian labor market on the supply of lateral entrants?

#### Recruiting Effectiveness

- Research should be conducted that will indicate to the Recruiting Command how to integrate better with the nation's educational system, e.g., how to gain access to high schools that have quality students who can be recruited.
- There is a need for work on how to re-deploy and reorganize so as to tap a new market when the Recruiting Command is already using all its resources.
- Incentives for recruiters should build on the Freeman plan, which is used by the Navy Recruiting Command. What the recruiter is trying to maximize—e.g., percentage of high-school graduates enlisted—should be congruent with the incentive and goaling systems. These linkages could use additional analysis.
- The Recruiting Command needs an early-warning system allowing it to prepare for swings in the business cycle.
- Methods by which the Recruiting Command can better cope with business cycles need to be developed. Can active-duty personnel or Delayed Enlistment Program (DEP) inventories be used to help the Navy recruit people when economic conditions are better? Can advance agreements be reached with Congress and OSD that would allow the Navy to make rapid increases in military pay, bonuses, number of recruiters, reserve strength, and strength, enlistment lengths, or advertising outlays when civilian unemployment declines? Can an analytically sound case be made for allocating the resources required? Research should be done to find out how other organizations anticipate and manage across business cycles.
- The Navy needs analytical support for the widely shared belief that the DEP provides a recruiting multiplier. Do members of the DEP help to recruit additional individuals? Do high-quality -- i.e., high-school-diploma, upper-mental-group -- individuals in the DEP recruit other high-quality individuals?
- There are differences among recruiters in productivity. Can these differences be explained and changes be made to recruiter productivity by changes in recruiter selection and training programs?
- Studies of how the recruiter interacts with recruits might help to explain differences in effectiveness among recruiters.
- A study should be made of the effect of time-on-job on recruiter productivity.
- Case studies of effective and less effective recruiting organizations might yield insights concerning top-level management actions that would increase recruiting effectiveness.
- We must get better at testing ideas and moving in new directions while maintaining operations. Field studies and experiments can—but need not—be disruptive of recruiting efforts.
- New systems, both coming on-line and planned—e.g., CAT, CLASP, and JOIN—will change the recruiting business. We should decide now how to integrate them into our operations, rather than be content with reacting when they are imminent.
- Recruiting procedures and systems should be compatible with military mobilization requirements.

#### WHEN TO RECRUIT, AND HOW MANY?

- A fundamental issue that continues to need study is this: What kinds of personnel, and in what numbers, does the



Navy need to recruit? The recruiting policies of the services may not be based on what they need, but, instead, on what they can get.

- We need to get on with measuring job performance and with validating enlistment standards against measures of job performance. In order to derive rational accession policies, we require job performance measures.
- If we can't use job performance measures, we should validate enlistment standards--e.g., education and mental group--against A school performance. We should find out what A school attrition would be and what it would cost, if enlistment standards were changed and A school output were maintained at the required level.
- Recruit quality tends to be defined in terms of recruit qualifications. High-school-diploma graduate, upper-mental-group personnel may not be better performers than less qualified personnel; it may depend on the job. In addition, will the higher quality personnel who are joining because of the economy leave when the economy improves? If so, won't the problem be worse than it would have been if they had never come in?
- Enlistment standards research tends to focus on "screening out." Can't we look for supplemental predictors that would help us "screen in" some of the individuals who are now being rejected? This work could be useful when the market grows tighter.
- In addition to young (18-21 years of age) non-prior-service males, the services should learn to mine other sources of recruits, including women, prior-service personnel, lower-mental-group individuals, junior-college males, and older non-prior-service individuals.

- There are a number of questions surrounding the use and recruitment of lateral entrants: Where are they? Who should be selected? What pay and bonuses will they require? What training will they require? What is the cost-effectiveness of accepting lateral entrants vs. training the usual non-prior-service enlistee to that same level?

- The services are hesitant about widespread recruitment of lateral entrants for several reasons. Even after the lateral entrants have received accession training of various sorts, will they adjust well to military--e.g., shipboard--living conditions? Will they know the language and equipment known by other people of their pay-grade? Will they be accepted as leaders and role models by individuals coming up through the ranks?

#### HOW DO WE REDUCE THE DEMAND FOR ACCESSIONS?

- The services need to move manpower supply and requirement projections out of the closet and into the systems acquisition process. The estimates of numbers by quality level that we can recruit need to be used by the non-manpower community for making system and force-level decisions.
- Job redesign and labor-labor substitutions should be considered as ways to hold down the demand for high-quality non-prior-service males. The pay implications of requiring a large number of high-quality people should not be ignored.
- Most directly, the demand for accessions can be held down by increasing retention via higher reenlistment bonuses or improved living and working conditions.

## REPORT OF WORKSHOP: TRAINING

by

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### INTRODUCTION

The Navy trains people to support Navy missions, but there are many weaknesses in devising the training and providing it. The Navy does not have a systematic way of determining what skills should be taught, how to impart these skills, and how to measure success in training. The Training Workshop examined these issues. Although there was some disagreement about solutions to problems, there was significant agreement about specific areas that need further research.

Specific problem areas can be identified, but the causes are often unclear. If a program fails, the fault may lie with inadequate management, misplaced incentives, or use of inadequate or incorrect data in the analysis of the program. Or the policy underlying the program could be bad. The causes of a problem must be known before it can be dealt with.

Training is part of the overall career and occupational management system. When viewed in this way, it is clear that formal training, assignment, on-the-job training, rotation, and personnel retention are all related. Understanding the training process is also important when new, highly technical equipment is procured; though this issue was not addressed specifically in the workshop, it should not be overlooked when a research agenda is set up.

### WHAT SHOULD BE TAUGHT?

Most training in the Navy is designed to prepare people to enter unique occupations. These occupations can be broken down into the skills required. Yet, there is no systematic and automated compilation of these skills by occupation. The ability of educators and technical experts to construct curricula is limited. Researchers can help the Navy determine what information should be collected.

The method for constructing curricula needs further study. Present Instructional System Development (ISD) procedures are very costly and drawnout, and have not cut instruction time as expected. The reason may be problems inherent in ISD or in its present implementation. If ISD is not maintained, are there alternatives to improving curriculum development? Improvement of fleet inputs,

possibly through new instructors returning from the fleet, should be examined.

Some argue that curricula can be developed with the aid of a computer. Computer routines would organize the required information into the tutorials, drills, games, simulations, work models, and tests needed in teaching. The feasibility and cost of such a system should be examined.

### MEASURES OF TRAINING EFFECTIVENESS

There was general criticism of written tests as the means for measuring acquisition of skills, particularly when a test is given immediately after the course. There are many dimensions to success on the job, and most cannot be captured by these tests. Determining the efficacy of training requires better feedback from fleet experience.

There are both informal communication channels and formal questionnaires. The informal process is too haphazard to be reliable. And the questionnaires have been criticized for asking the wrong questions and not eliciting critical responses. The value of UNITREP, PEBs, and other reporting systems has not been agreed upon. All these areas should be examined as feedback mechanisms to the schoolhouse.

Fleet exercises could be better used to determine the value of training. The exercises measure the team and not the individual, which is probably what should be measured. But, some participants in the workshop were skeptical about the chance that the exercise data will be used. Preparations are made for specific exercises, and the ability to link problems with specific curricula is limited. Observers have been placed on ships to watch individual performance, but this practice may be disruptive. It was recommended that individuals be pulled off ships, after limited notice, and tested. Research should be done to determine how information derived from fleet exercises can be used to measure the effectiveness of training.

### HOW TO TRAIN

The role of computers in training needs further examination. Computers have proved efficient in training large numbers of people. With a shortage of petty officers and an expanding Navy, this efficiency is particularly important. On the other hand, today's computer-managed instruction may not prepare an individual for a military work environment. Some feel that an instructor serves as a role model, that competition with classmates is important, and that close supervision is

necessary for new enlistees. The value of the present method of testing with computers was also questioned.

Given a place for computers in instruction, a host of other issues must be addressed. The appropriate computer architecture and networks must be identified. Consideration should be given to the role of microcomputers and their integration into the present system. The possible value of expanding the use of simulators and graphics should also be examined.

The Navy has begun to mix formal and on-the-job training. The formal portion of the training, carried out on the ship, is known as on-board training (OBT). Apparently, OBT has a low priority on the ship. It is done at odd hours and is not closely monitored. Can OBT be improved, or is it unworkable on a ship? The merits of OBT need examination.

#### DETERIORATION OF SKILL

As soon as people leave school, they start to forget what they learned. The best way to maintain skills is to practice them. But, even with practice, some skills depreciate. What is needed is a better understanding of the rate at which skill is lost and some idea of how this loss can be checked.

A number of issues related to deterioration of skill surfaced. Some participants said that people are sent to the fleet and placed in menial jobs unrelated to the skills they have learned. The skills deteriorate, and, when they are eventually required, they are less sharp than they should be. If there are menial jobs that must be done, it may be advisable to send more people to the fleet

before schooling. Many other factors of this sort should be considered. This is an important issue to examine.

Deterioration of skill also has implications for the management, size, and use of the Reserves. In the active fleet, the need for exercises and high optempo should be considered in the context of the need to maintain skills. The cost of rotation should also be examined.

#### IMPLEMENTATION

Three problem areas were highlighted. One is the need for improved incentives. Many instructors see teaching assignments as detrimental to their careers. They seek to avoid them and are not pleased when assigned. There was a feeling that instructors need incentives to provide the training the Navy needs. Students also need greater incentives to learn, and in flexibly paced courses, to learn quickly. Rewards for both instructors and students should be identified.

Another general problem is the difficulty that the training establishment has in garnering resources. Training experts believe that those who control resources do not appreciate the value of training and are resistant to innovation. Those who control resources feel that the training establishment does not justify its resource requirements and often takes the position of "trust me."

Finally, there is a general problem in defining who governs training. Some participants said that training has too many masters. Responsibility for training should be examined.

## REPORT OF WORKSHOP: RETENTION

by

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This working group concentrated on four major topics: (1) continued management of the All-Volunteer Force, (2) specific areas of potentially fruitful retention research, (3) development of new data sources to support the research, and (4) improved interaction between the researchers and the users of research.

### The All-Volunteer Force

Continued management of the All-Volunteer Force requires adaptation to changes in the civilian economy and in demographic conditions. The Navy must respond to changes in civilian employment and private sector demand for skilled personnel. The Navy must adapt to the declining size of the youth population, the growing fraction of married people in the military, and the increasing incidence of couples in which both spouses are in the military. The Navy must also deal with the potential exodus from the military of individuals who are eligible for educational benefits.

In addition to changes in the availability of personnel, there will also be changes in the Navy's requirements for personnel. There are proposals extant to increase the size of the Navy to 600 ships. Moreover, quality as well as quantity of personnel will have to change in response to the introduction of more complex technology.

All of these factors suggest the need to consider new sources of supply, such as prior-service and lateral entrants. Moreover, analysts should explore the possibility of cross-training between related Navy ratings and remedial training of lower-mental-group individuals.

### Research To Consider

Several specific types of potentially fruitful research into retention were discussed. First, existing retention models must be further refined. These models are indispensable for forecasting the effects of compensation changes on retention and the resulting force structure. Existing models, however, are deficient in several respects.

Retention must be broken down into its components of reenlistment and extension. This decomposition is essential for forecasting because the evolution of the force depends critically upon the stock of contracted man-years. Analysts must also develop separate retention models for individual ratings or rating groups in which shortages are expected.

Another important area of research is in introducing non-pecuniary variables into retention models. These variables have to do with such aspects of military life as sea-shore rotation policies, length of deployment, promotion probabilities, housing conditions, and availability of health care. These variables have been neglected in the past; they must be included in more comprehensive analyses in the future.

Another deficiency of past research is failure to account for decision making by military families. Analysts must look more closely at employment opportunities for spouses and availability of schools and housing.

Retention models should be integrated with force planning models. For example, retention models can be used to forecast the effects of compensation changes on retention. But the resulting force structure must be checked for compliance with DoD-mandated constraints, such as endstrength ceilings, maximum attrition rates in boot camp, and desired promotion rates.

Retention models must be applied to specific policy applications, including expansion of special pay, such as sea pay and proficiency pay, and possible introduction of occupationally-specific multiple pay tables. Other specific policy issues include early vesting in retirement, relaxation of the \$16,000 reenlistment bonus ceiling, and lump-sum-versus-installment bonus payments.

The workshop also noted a need for analyses of cost and productivity, to be used in conjunction with retention analysis. For example, third-term reenlistment bonuses cost several times as much as first-term reenlistment bonuses. The additional cost of a third-term bonus is justified only if the productivity of third-term personnel is correspondingly high. More research is needed on relative productivity of individuals, not only in different terms of service but in related ratings as well.

\* Assisted by Mr. Matthew S. Goldberg of CNA.

### Development of Data Sources

The workshop discussed the need for new data sources to support research. In past surveys, individuals leaving the military have been asked their reasons. Individuals who stay in the military should be asked why they do.

Analysts need detailed times-series data on civilian employment opportunities in selected occupational areas where the military expects to be competing for skilled manpower. Also needed is data on the pool of potential lateral entrants into the military.

Military pay and allowances are easily measured, but more attention must be paid to

measuring non-pecuniary variables describing rotation and deployment policies and other aspects of the quality of military life.

### Improved Interaction

Finally, the workshop discussed the need for increased interaction between researchers and users of research. The operational managers in the services can help by supporting collection of new types of data for retention analysis. Moreover, managers must make researchers aware of specific policy issues that are likely to be considered by legislators. Once made aware of these policy issues, researchers can develop suitable cost-effectiveness analysis.

## REPORT OF WORKSHOP: RETIREMENT

by

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### Pressure for Change

The workshop participants reached general agreement in at least one significant area: that, regardless of anything the individual services, DoD, or the research community may do, there will be pressures for change in the military retirement system. It was felt important to begin by understanding these pressures.

The workshop began by identifying sources, exogenous and endogenous to the military, from which these pressures might emanate. As a result of these pressures, the retirement system of the future could differ from the retirement system of the past. The following sources of pressure were identified and discussed:

- Cost containment
- Social Security reform
- Equity and comparability with private industry
- Comparability between government civilian and military employees
- Internal Navy pressures if force requirements are reevaluated and changed
- General cost-effectiveness questions concerning mix of current and deferred compensation
- Pressures from other services
- General societal changes (healthier population that expects a longer worklife).

The most apparent—as well as immediate—reason for expecting changes is the projected budget deficit. Congress is in a cost-cutting mood, and the budget for military retirement is not trivial. Although no proposals for changes in the basic retirement structure are now before Congress, various legislative proposals that have been submitted would make significant changes in the level and distribution of retirement benefits in the future.

Moreover, the Office of Management and Budget is preparing a menu of cost-cutting changes for Congressional consideration.

There is a general feeling that Social Security changes are coming, that the system is in trouble, and that solvency implies reductions in future commitments of the system. Any change (or proposed change) in Social Security or retirement from civilian jobs in this government would prompt consideration of changes in the military retirement system.

Similarly, comparisons between pension plans in the private sector and pension plans in the government are becoming more frequent. The popular press suggests increasingly that equity concerns dictate changes (e.g., reductions in the level of military pensions).

Other sources of change might come from within the military. Evolving changes in force needs or structure, perhaps caused by changes in technology that dictate a different age-experience force mix, might suggest changes in the retirement system. Alternatively, internally initiated concerns over cost-effectiveness might suggest system changes. Either of these initiatives could, of course, come from within the Navy itself or from one of the other services.

Finally, some participants felt that general societal changes might prompt reconsideration of the military's relatively early retirement. People are healthier and live longer than in the past. And, though participation in the labor force has dropped sharply for males over 50, there are some contrary trends, such as the delay in mandatory retirement from 65 to 70 years.

Against this backdrop, the workshop identified three categories of needed research: short-term reactive, general policy questions, and major system alternatives. We shall discuss these in turn.

### Short-Term Reactive

Ken Coffey, from his vantage point in the GAO, stressed the continuing inability of the services to respond adequately to near-term needs of the Congress. Specifically, he and Paul Zinsmeister noted the frequent lack of objective research when proposals are being considered by Congress. In this vein, the relatively quick adoption of the "high-three" in September 1980 was cited and much discussed.

\* Assisted by Dr. Aline O. Quester of CNA.

Under this change in the retirement system, military retirement pensions are based on the average of the three highest paid years; previously, the initial base was the pay scale in effect upon retirement. Grandfathered for 20 years, the change will affect only those who retire in September 2000 or after. Apparently, the "high-three" computation was adopted more on the assumption that it would save money than on any empirical analysis; in short, Congress lacked empirical research that would compare the dollar savings of "high-three" with the higher costs of inevitably lower retention rates.

Several points were made in the course of the ensuing discussion: First, the research capability already exists within both DoD and the Navy to analyze retention effects of such changes as the "high-three." Paul Hogan, of OSD MRA&L, pointed out that John Warner's ACOL model is in place and that changes in retirement pay occasioned by legislative proposals can be fed into the model; the model will then predict how such changes in pay will affect retention over the career profile. One obvious problem is inherent in estimating retention effects of changes that are grandfathered--the uncertainty surrounding the future pay parameters that define retirement benefits. Still, it was felt worthwhile to estimate retention effects of retirement reform proposals within the framework of the ACOL or similar models.

In terms of quick-response situations, there was general agreement that organizational interfaces and lines of communication could be improved; in short, though more analytical tools could be used, the objective research capability now in hand is not used effectively.

The workshop group listed proposals for change expected in the near term. Congress would benefit from objective research into the expected retention effects of these changes:

- Look-backs (multi-year or single-year)
- Recomputation
- Reverse recomputation
- Retiree fringe benefits
- Method of indexing retirement benefits
- Social Security offsets
- Reserve retirement benefits
- Change in the years of duty for eligibility
- Ex-spouse provisions

Recognizing that research is not a free good, the workshop did not reach agreement on the relative importance of short-term reactive and longer term, more anticipatory research. Before a review of the discussion of broader research suggestions, therefore, it is worthwhile to focus on some of the more general issues raised in the discussions.

#### General Considerations

The first point made was that deferred compensation (retirement pay), to be effective, must be predictable. One way to increase the certainty surrounding retirement pay is to let the system alone. The notion here is that changes in the system, no matter how minor they appear, increase the uncertainty surrounding future retirement pay: If there is a change today, there may be a change tomorrow. Every change makes the next one easier. As many participants pointed out, the retention value of retirement pay is related directly to the perceived security of that pay.

This line of reasoning suggests that the current state-of-the-art modeling of retention effects induced by retirement pay changes may understate the true retention effects. Change reduces the credibility of the system and erodes confidence, and more people leave the military than would be expected to leave as a result of any specific retirement pay change alone. Retention rates after the third enlistment term are, of course, very high and must be balanced against the latter argument.

A related point concerns the part played by the retirement system in career force management. The military is a closed personnel system with virtually no entry points except at the bottom. The current retirement system--particularly the fact that retirement costs are not computed on an accrual basis--partially shields career military compensation from the political arena and the short time horizons that often affect Congressional action. If the total compensation package for military personnel were as vulnerable as current compensation, many feel, short-sighted pay caps like those of the mid-1970s could hurt planned force structures badly. Repeatedly it was emphasized that any change in the retirement system must not affect the services' ability to keep pay competitive; this is especially critical for individuals with experience levels in the top third of the force-structure pyramid. Captain Hale and Captain Jones were particularly strong on this point.

A somewhat different point, raised by both John Warner and Paul Hogan, centered on research suggesting great individual preference for current compensation over deferred compensation. This research suggests, in fact, that the rate of discount among military personnel probably exceeds the government's rate of discount by a substantial amount. The services could therefore lower their personnel costs by placing a higher proportion of total pay in current rather than deferred (retirement) compensation. One aspect of deferred compensation, the fact that end-loading pay improves productivity by making terminations more costly, is not yet well integrated into economic models that evaluate current and deferred compensation. Paul Hogan stressed the importance of modeling this phenomenon before drawing any conclusions about cost-efficient pay structures based on discount-rate analyses.

The group returned repeatedly to the uniqueness of the military retirement system: No vesting until 20 years of service, when, for many, retirement begins. Though the system provides severance pay for officers who are separated involuntarily before the 20-year point, there are no such provisions for enlisted personnel.

Phil Odeen, one of the Commissioners on the PCMC,\* reviewed the work of the Commission for the group. He stressed the Commission's position that the present vesting arrangement for military retirement was misguided on the grounds of both equity and force management. The PCMC had recommended vesting after 10 years of service and enabling military personnel, after 10 years of service, to draw on some of their retirement trust funds. His comments led to a discussion of two important points:

First, most major retirement reform proposals, like the PCMC's, require that one "spend to save." Any major retirement change must be grandfathered (all workshop participants agreed that renegeing on implicit retirement contracts would be unacceptable). Moreover, retirement dollars are not budgeted on an accrual basis. Taking some of the money that would have been paid at 20 years of service and paying it after 10 years, instead, means more money during the transition (the old retirement system for those at 20 years of service, plus the costs of the new retirement system for those at 10 years of service), although the system usually saves money, once the transition period is over. Congressional

time horizons make spending today to save tomorrow not particularly appealing. In short, even if agreement could be reached on an optimal retirement system, the problem of "how to get there from here" may create an impasse.

Second, Odeen's review evoked considerable discussion of what may be called requirements, optimal force structure, or cost-effective manning configurations. In a workshop that did not generally display much agreement, all agreed that little is known about relative productivity, and the substitutability of personnel in different experience levels.

Glen Gotz suggested that, without an understanding of the value of alternative force structures, it is impossible to devise the optimal compensation scheme. Captain Jones pointed out that the military may well have the power, within the present retirement system, to create inducements for more personnel to stay beyond the 20-year point; the problem is that the services do not know whether they want these individuals to stay because the services do not know whether these individuals are productive enough to make the inducements cost-effective. Both Warner and Hogan stressed the simultaneity of the problem. In short, the retirement workshop gave top priority to productivity research.

It should be noted, however, that the position of the PCMC, and of several workshop participants, was that the present retirement system is too important a determinant of the force structure, that more compensation should be up-front. Moreover, current compensation is more flexible than deferred compensation, because any changes in the latter must be grandfathered.

#### Broader Areas of Concern

Workshop participants discussed several broad areas in which research would be of benefit. Though some are outside a narrow interpretation of the retirement group's charter, the participants believe that more research on the following issues is warranted before many specific retirement questions can be addressed adequately:

- Productivity: Are the right people staying and the right people leaving?
- Effect on the Reserves: How will changes in the retirement plan affect the Reserves? The broader question of

\* President's Commission on Military Compensation, formed by President Carter.



the function and the capabilities of the Reserves then arises.

- Civilian employment opportunities for military personnel: This research is needed both for personnel who leave before retirement (to evaluate severance pay proposals) and for personnel who retire (to evaluate their transitions into civilian employment). It would be preferable if this research could be conducted in the context of lifetime income for comparable military and civilian personnel. If it included the income of spouses, the loss in income of career military spouses (because of geographic instability and other service-unique factors) could be costed accurately.
- Interrelationships between retirement and other forms of military compensation: Included is additional study of individual discount rates, as well as consideration of the payoff the services get from deferring compensation.
- Targeted retirement plans: officer vs. enlisted, combat vs. non-combat ratings, etc.
- How to make retirement benefits more credible: It might, for example, be

worthwhile to study contributory retirement systems.

- Cost-effective smaller changes in the system: There is fairly clear agreement that some technical personnel are productively cost-effective at the 20-year point; the inducements required to get them to remain on active duty are yet to be determined.

#### Summary

Without so-called optimal force requirements, without knowledge of the output achievable under alternative force configurations, and without any reliable measures of the productivity of different military experience profiles, it is hard to evaluate the efficacy of the present retirement system. Though some participants saw the present retirement system as meeting Navy needs for force management, others were not so certain. All agreed that the past decade has produced quantum leaps in understanding issues of military labor supply. To a considerable extent, one can calculate the effects on retention of changes in compensation, including changes in retirement pay. The participants hope the next decade will produce similar advances in understanding of military demand issues. It will then be possible to deal more effectively with the role of the retirement system in optimal schemes of military compensation.

## REPORT OF WORKSHOP: CIVILIAN MANPOWER

by

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*Center for Naval Analyses*

Despite the wide range of backgrounds and views represented in the Civilian Manpower workshop, two points met with general agreement:

- Civilians play a crucial role in defense.
- This role is woefully misunderstood throughout the government and among the public at large.

The Defense Department has slightly more than a million federal civilian workers, many of them in key management and technical roles. The services also depend heavily on private employees under contract in a wide variety of positions, from base support functions to technical jobs aboard combatant ships.

Despite the importance of civilians to DoD, little time or money is spent on analyzing problems of civilian manpower. Though this is not primarily a Navy problem, the Navy may pay a high price because a growing Navy will make extraordinarily heavy demands on Navy civilians.

The participants in the workshop agreed that a new approach must be taken to prevent a crisis because of manpower ceilings, pay caps, and increased workloads. Unfortunately, this new approach cannot be chosen on the basis of existing research; there is too little on which to base guidance. Most of the workshop sessions were devoted to the choice of research topics to fill the void. The working group's suggestions for research are summarized below under four, somewhat arbitrary, headings: (1) strategic planning and determination of requirements, (2) the compensation system, (3) non-pay constraints, and (4) methodology.

### 1. Strategic Planning and Determination of Requirements

The role of civilians in DoD and methods of measuring their contribution were two major subjects of discussion in this workshop. Several participants deplored DoD's lack of the strategic, top-down planning—found in the private sector—that relates the goals of an

organization to personnel planning. This lack affects every facet of the process of determining requirements, from peacetime planning to war scenarios.

One particularly weak spot appears to be the interface between war and peace—mobilization planning. Little is known about the enforceability of contingency clauses or the legal status of employees of private contractors who serve in key positions as technical representatives aboard ship. The war in the Falkland Islands was cited as an example of the important contribution that civilians make in a war. Consequently, the role and mobilization of civilians during that crisis were suggested as potentially valuable subjects for research.

Many members of the workshop expressed dissatisfaction with the Navy's present process for determining civilian manpower requirements, the SHORSTAMPS program. The entire group agreed, however, that some relationship between workload and personnel needs is required for judging efficiency and calculating the potential for accommodating greater workloads, particularly in the absence of good productivity measures based on output. There was some discussion of output or productivity measures as alternatives to workload measures, but little confidence was shown in the quality or consistency of existing measures, and little hope was held for developing consistent, output-based productivity measures throughout DoD.

A great deal of discussion was devoted to the effects of competition on productivity, both actual and measured. Competition from the private sector serves as a yardstick designed to measure productivity and as a challenge designed to raise productivity in the government.

The possibility of introducing competition between similar units within DoD was also discussed. This technique has been used by school systems to measure and encourage productivity. Almost all the participants in the workshop thought that research into ways to increase competition in DoD would be valuable, both for requirements/productivity issues and for many other problems of civilian manpower. Recent disputes over the wisdom of increasing DoD use of the private sector (contracting out) have led to little effective research into the costs and benefits of different mixes of military, federal, and private manpower in DoD. The workshop participants agreed that such research is long overdue.

\* Assisted by Dr. Kathleen P. Utgoff of CNA.

## 2. The Compensation System

Despite the wealth of studies of the reactions of military personnel to changes in compensation, little is known about the responses of civilians to changes in their pay system. In the workshop, there was a great deal of discussion about the potential damage caused by the present, inflexible pay system, particularly the damaging effects of pay caps.

All the participants suggested research designed to estimate the effects of current and alternative pay policies. Research into the retirement system, relocation expenses, and fringe benefits was suggested. It was also agreed that alternatives to present pay tables should be investigated. Some of the alternatives include temporary bonuses for special occupations and more flexibility in permanent pay tables across occupations and geographic areas.

The present pay system is thought to be poor with respect to temporary and occupation-specific problems, like those which now affect engineers and computer specialists.

The workshop participants also discussed basic compensation principles. Three alternatives were suggested:

- Equal compensation for equal work in federal and private employment.
- Equal compensation for equal skills or credentials.
- As in the military, pay based on the ability of the pay system to attract and retain people.

This last approach looks at turnover statistics, such as vacancy rates and quit rates, rather than compensation exclusively. Under both equal-compensation rules, direct pay and fringe benefits would be combined into a single measure for comparing federal and private compensation--a difficult, if not impossible, task.

The turnover method overcomes this problem by relying on "revealed preference" as an implicit measuring device; an employee who quits one job for another must, in some sense, consider the new job better. The main difficulty with this method is in determining and achieving the optimal turnover rate. Some workshop members felt that turnover data is too hard to collect in time to prevent a disaster and that, therefore, turnover could never serve as a non-destructive test of the appropriateness of compensation policies.

The disagreement among the participants about the merits and drawbacks of these principles made it clear that a great deal more research is needed.

The pay cap for high-level civilians was discussed by a number of participants. All felt that the cap has a pervasive and detrimental influence on all aspects of the civilian manpower problem but that it is hard to argue against pay caps without firm evidence of the effects. Everyone agreed that research into these effects deserves high priority.

## 3. Non-Pay Constraints

Many of the problems discussed by the participants result from constraints on the hiring and use of civilians. These constraints include limits on the total number of civilians on the payroll and limits on the number of employees at the higher grades. There are also hiring, firing, classification, and equal-opportunity constraints, as well as many regulations that affect choices among military, federal, and other workers for jobs. It is clear that these constraints cause problems--a whole workforce of temporaries exists to circumvent civilian manpower ceilings--but why these constraints are necessary is not clear. Though several rationales were proposed at the workshop, it was apparent that more research is needed.

Some participants felt that these constraints are unnecessary so long as resource managers are threatened, through some form of competition, with budget cutbacks for inefficient performance. These participants argued that managers who face adequate competition should be limited with respect to total budget only. Others favored constraints on at least the portion of the budget devoted to manpower.

Experiments in the Navy laboratory community--which is industrially funded--seem to support the contention that managers need few constraints if they are faced with competition. It seemed clear that research into the effects of competition and the possibilities for introducing it should have high priority. It was also clear that getting rid of the worst constraints would be nearly impossible without better evidence of their detrimental effects.

One important--though little recognized--factor that was discussed at length was the constraint on DoD to act like the rest of the government in its treatment of civilians. At least one workshop participant said that many of DoD's personnel problems are caused by this need to behave like other, very different, agencies, that a military organization, with

many technical and engineering slots, needs rules that do not necessarily apply to other types of organizations. The workshop participants agreed that Congress treats DoD differently from other agencies in some respects, but they think there is little chance that DoD will be granted separate authority with respect to personnel. Some participants believe that DoD might be better off with its own personnel system, but that the issue may not be suitable for research.

#### 4. Methodology

The workshop also discussed improvements in the research tools needed for the suggested research. Many of the research topics require better measurement tools--for example, new ways to determine wage elasticities. A method to integrate pay and non-pay factors in an

overall analysis of labor supply would also be helpful. Better approaches to personnel planning models are also needed. The workshop members agreed that existing data should play a more important role in civilian manpower planning; they discussed ways to increase the dissemination and use of data.

#### Conclusion

The workshop agreed on a number of important research topics. It does not appear, however, that disagreement about the value of research topics is a major problem. The main stumbling block is the lack of attention and resources devoted to the problem. This is not a Navy problem alone, but the Navy has so much at risk that it should lead in activating the research community and drawing attention to the need.

## REPORT OF WORKSHOP: MOBILIZATION AND THE RESERVES

by

Ms. Mary Snavelly-Dixon\*  
*Independent Consultant*

### INTRODUCTION

Workshop participants felt strongly that the whole issue of Reserves must be examined in the context of mobilization and wartime. Although many individual Reservists and Reserve units contribute valuably to the Navy's peacetime commitments, it must remain clear that the Reservists' primary purpose is to complement the active duty Navy in time of war. It is in the context of total war-fighting needs and capabilities that the Navy must define its needs and make its management and resource decisions regarding the Reserves.

### General Observations

The consensus that emerged from the workshop discussions is that the Reserves should receive attention as an important component of the total force. It was felt that Navy resource decisions give low priority to documented manpower, equipment, and training needs of the Reserves.

These simple steps should be taken:

- Active units should become associated more closely with Reserve units assigned to augment them upon mobilization.
- Reserve augmentation units should be considered when personnel readiness is calculated under the UNITREP reporting system.
- Active units should be encouraged to drill with Selected Reserve units. Training with active units may be the only way for some Reserve units to be ready to use the equipment they will operate and maintain upon mobilization. Coordinated Reserve and active interaction will improve the utility of Selected Reserve units upon mobilization.

The Reserves have not been accorded higher priority in recent years for the

following reasons, among others:

- The Navy has been operating at a higher tempo for the past 3 or 4 years.
- Maintaining a third navy in the Indian Ocean has taken more money and has exacerbated manpower shortages in the active duty Navy.

These commitments have imposed additional demands on already strained resources. Still, the workshop participants felt that a fresh look is needed to make sure that resources, management policies, and attitudes are suitable for a Reserve that is an integral and essential part of the total mobilization force.

### RESEARCH AGENDA - FIRST ORDER

The most serious deficit in information noted by the workshop is in mobilization manpower requirements. The Navy Manpower Mobilization System (NAMMOS), a good statement of macro mobilization manpower needs, is accepted and being instituted. NAMMOS alone, however, is not enough. NAMMOS tells us total manpower requirements upon mobilization, but does not derive empirically the optimal mix of types of personnel that will best fill these requirements.

Determining the right manpower mix is not a simple problem. The two categories of Defense people--military and civilian--divide into a variety of groups. Military personnel include Active Duty, Selected Reserve (SelRes), Individual Ready Reserve (IRR), Standby Reserve, and retired inventories, as well as any new accessions, both volunteers and draftees. The civilian component is made up of peacetime employees (minus those who would fill military jobs upon mobilization), contractors, and new hires. All these kinds of mobilization assets are available to absorb the mobilization workload. The present state of knowledge, however, does not enable us to determine, empirically or analytically, why we have the mix we do or what the optimal mobilization mix would be. Properly designed research is needed.

To make intelligent decisions about the composition of the manpower mobilization mix, we must have some understanding of the relative supplies of these different categories of people and of supply interactions. Clearly, most of the people come from the same general population. We must appreciate the differing

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costs and capabilities of personnel categories in meeting the mobilization workload.

The one factor that seems to have the greatest effect on the manpower mix issue is training. A Rand study of Army Reserves showed wide variations in unit readiness. Reserve units drilling with the active duty units they would augment showed the highest indicators of readiness. This finding suggests that a better training strategy may be found. A whole series of training questions affect readiness; their answers may suggest ways to improve the mobilization manpower mix:

- Relative cost and effectiveness of training
- Relative skill depreciation
- Relative pre- and post-mobilization training requirements
- Feasibility and cost of cross-training.

Most of these training questions should be considered at the occupational or skill level. These issues are keys to assessing the relative capabilities and costs of the various personnel resources for mobilization.

Yield factors and response times must also be considered. Currently, the yield factor is a matter of policy that says the Navy will get a stated percentage of the Standby Reserve, Individual Ready Reserve, Selected Reserve, and retired personnel upon mobilization. Members of the workshop think that planning would be improved if yield factors were derived by analytic estimation. Research evaluating the likely effects of failure to achieve expected yields should also be conducted.

Response time is also something about which little empirical evidence is now available. The time it takes to mobilize various categories of personnel will be crucial when the mix required for the early stages of mobilization must be determined.

Something to bear in mind through all phases of the research is this: The one thing that can be said with certainty about mobilization is that we will not fight the war that we are planning for. Therefore, we ought not to try for such great precision that the system lacks all flexibility.

#### Secondary Research Issues

Once the appropriate mix of personnel within the mobilization manpower pool has been

identified, there are a host of supply issues. The principal area is compensation effects on enlistment and retention for both Selected and Individual Ready Reservists. Research indicates some differences in response. For example, in the DoD IRR bonus experiment, the bonus offer led to a positive response in reenlistments. On the other hand, analysis of the Army reenlistment bonus experiment indicates small responses of Reservists to reenlistment bonuses, but longer average obligations for those who did reenlist. Thus, the Army's strength increased, even though few additional reenlistments were generated.

Another retention issue has to do with reasons for termination of Reserve affiliation. Rand survey work shows that, for Reservists with 6 to 8 years of service, the two major factors in Reserve attrition were employer and family conflicts. For Reservists with more than 8 years of service, a third factor became prominent in the termination decision--lack of opportunity for promotion. This does not seem to be a compensation-related issue; it seems related, rather, to prestige in the unit and in the community. Some research is needed on nonpecuniary policies in personnel management. For example, experiments could be designed to test alternative approaches in Reserve management to minimize employer and family conflicts. It may be that behavioral considerations are as important as economic factors.

Though estimated SelRes responses to compensation increases have been small, we must remember two points: First, virtually no Reserve compensation analysis of the Navy or of potential prior-service enlistments in the Reserves of any of the services has been done. Second, Reserve compensation is a relatively small part of total income for most Reservists. Current compensation levels have produced a situation where most Reservists who continue to participate do so for reasons other than financial.

#### Research Constraint

The experience of researchers to date suggests that the greatest problem in analyzing mobilization and Reserve research questions will be the lack of data--particularly quality data--covering all categories of personnel except active duty military. Addressing the issues on our research agenda will require the collection of a great deal of original data. The research project will, therefore, take longer, but the effect is not all bad. Researchers will have the opportunity to design and structure the data collected so that it is analytically useful. In addition, we have as background a wealth of experience from

the personnel research that has been done for the active military. We should be able to avoid repeating past mistakes.

#### Summary

Much research needs to be done on mobilization and the Reserves because so little is known about this important resource. Part of the reason is the lack of quality data on Reserves, but, we think, more can be ascribed

to the relatively low priority assigned to mobilization issues and the Reserves.

Our first research priority is providing an improved basis for determining the appropriate mix of personnel to fill mobilization requirements. Only when we know what portion of the mobilization burden each component should shoulder, can we properly design policies for managing these components. Members of the workshop believe that the research agenda described here should prove useful, at least through the 1980s.

## REPORT OF WORKSHOP: POLICY INTEGRATION

by

Mr. Robert F. Hale\*  
*Congressional Budget Office*

### INTRODUCTION

The policy integration workshop stressed the need for a long-term military manpower plan, institutionalization of manpower policy integration, and a research agenda to support long-term planning.

### GENERAL OBSERVATIONS

Manpower policy might be better integrated if the Administration agreed on a plan and presented it to Congress. Elements of such a plan already exist within the services, but no overall plan has been developed and approved. An overall plan might specify end-strengths over the next 3 to 5 years, along with the numbers and quality of accessions and the numbers and types of careerists planned to meet end-strengths.

A manpower plan might minimize undesirable fluctuations in policy. Fluctuations occur, in part, because not all of the many participants in the process--the services, OSD, OMB, and as many as six Congressional committees--share the same goals. For example, determining whether to give a larger pay raise to career personnel and a smaller one to recruits depends on recruiting and retention goals that may not be shared by all the groups debating this key decision. A manpower plan would highlight key goals for debate. After agreement was reached, the effects of changes proposed by the Administration or by Congress could be assessed much more accurately.

A long-term military manpower plan would also help to institutionalize policy integration by providing a blueprint for focus, reference, and consistency. Eventually, such a plan might encompass civilian and Reserve manpower. Probably, OSD should manage the plan, tasking the services to generate inputs and review changes. Creating an explicit plan would probably be worth the effort, in view of the better coordination that should result.

To support long-term manpower planning and its institutionalization, the highest priority belongs to productivity and requirements research, work designed to determine the kinds of people needed and the trade-offs among them in promoting readiness. Accepted

definitions of readiness and internally consistent models that relate manpower resources to readiness are vital to development of rules for policy integration. Complete and believable data bases are necessary for exercising the models, particularly for life-cycle costing of manpower.

Manpower policy makers differ in perspective from researchers. Researchers often make assumptions that policy makers consider unrealistic. Policy makers sometimes display what looks like excessive caution about making changes. Researchers need better communication with policy makers to gain focus, understand contexts, and promote results that will be used. Policy makers would benefit from more explicit training in analytic methods.

Setting up a new organization to oversee all Navy manpower research is probably not justified, but existing groups should be tasked to better plan and coordinate research that supports manpower policy integration.

### SPECIFIC RECOMMENDATIONS

The present procedure in Navy manpower planning is to determine requirements, set accession and retention goals, and then manipulate policy tools one at a time to achieve the goals. Four steps must be taken to integrate this process: (1) adopt a framework for integrated planning, (2) develop relationships to fit into it, (3) identify desirable policy trade-offs, and (4) confront obstacles to making trade-offs.

#### Integrated Framework

A framework for policy integration is shown below. [SLIDE 1] Wartime capability, to which capital and labor services contribute, is the ultimate output. The labor or manpower component is a mix of active duty, civilian, and Reserve personnel determined by accession and continuation policies. This framework would help to identify what needs to be known about Navy manpower policy, respond to questions about policies, and balance manpower planning.

#### Developing Relationships

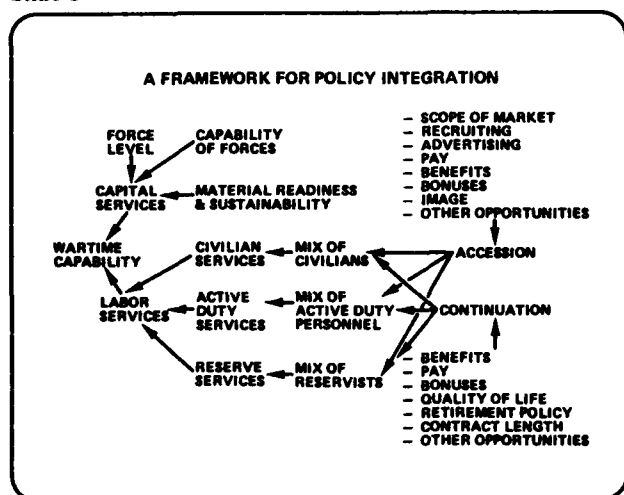
What is needed is a view of manpower requirements that focuses on personnel productivity and on substitutability among different kinds of personnel. Potential productivity research should encompass individual productivity data gained from surveys or supervisors and peers, as well as

\* Assisted by Dr. Robert F. Lockman of CNA.



unit productivity derived from readiness, exercise, and operational data. Productivity measures should also be related to requirements. Alternative ways of setting and filling requirements, including the use of targeted compensation, civilians, and lateral entrants, need investigation. The effects of varying the length of enlistment contracts on accession, attrition, and reenlistment also require study.

#### Slide 1



Questions about the Reserves require answers. Are the Reserves good substitutes for active duty forces? How can Reserve readiness be improved? How does the Reserve mission relate to national strategy?

Quality-of-life issues that consider both benefits and costs need analysis. Such analyses would permit trade-offs with

financial incentives and would provide incentives more adaptable to the kinds of individuals involved, for example, careerists or first-term personnel.

Measures of effectiveness that are more closely tied to expected success in wartime are needed. Not everyone helps to keep equipment working. Developing and validating performance indicators that reflect the contribution of people not involved in maintenance is a serious challenge. Relating resources to readiness and war-fighting capability is really a productivity issue. Some econometric work has related manpower characteristics and experience to equipment condition, sortie generation, and readiness exercise results; some simulation work has also been done. More is needed in both areas, as well as in development of budget-level relationships between manpower costs and capability.

#### Policy Trade-Offs

Specific trade-offs that need quantification are training versus retention, contract length versus bonuses, quantity versus quality of personnel, retirement versus active duty pay, and people versus capital equipment.

#### Obstacles to Planning

Finally, more flexible manpower planning across budget areas is indicated. Arbitrary constraints on numbers and paygrades of people, budget compartmentalization, civilian personnel ceilings, and mandated requirements --all make adjustments to market changes more difficult over time. These constraints must be confronted and evaluated if we are to have a real integration of manpower policy.

**CLOSING REMARKS**

## CLOSING REMARKS

by

Mr. Stanley A. Horowitz  
Center for Naval Analyses

As we opened our conference, I stated two reasons for Navy manpower research to be different in the '80s. As these proceedings draw to a close, I'd like to be a little more specific.

The first reason I saw for differences in research in the 1980s is that the environment will be different. Larry Goldberg may well be right when he says we can cope without massive structural changes, but his may not be the most efficient way to cope, and, in any case, the Navy may not be allowed to follow his advice.

Larry's work notwithstanding, in order to best adapt to changing market conditions, the Navy should try to draw upon an older mix of people. This means justifying a more senior personnel structure and then creating one. Research to date on both the productivity and the cost of Navy personnel of varying degrees of seniority supports the belief that the Navy should have more careerists. As many who have taken part in the workshops noted here, this work needs to be extended and solidified.

The Navy can draw from a more senior population, not only by increasing retention or lateral entry, but also by relying more on civilians and reservists. Many of the traditional arguments against increased use of civilians (and, for that matter, uniformed women) lose their force in the face of the increasing and successful use of sea pay. A Navy that can do with a smaller rotation base can fill its shore jobs on their merits. An exploration should be made of the full implications of sea pay and other targeted pays, particularly pro pay, which goes to people in hard-to-fill billets only.

Ways of adapting to the market by widening the role of the Reserves depend crucially, I think, on what kind of war we're thinking about fighting. The nation can make efficient use of Defense dollars--not only on manpower--if the decisions are based on an understanding of strategic thought and planning.

To broaden the role of the Reserves, we must be willing to devote resources to being able to mobilize. Though international analogies are dangerous, the fact is that the Israelis seem to have far more military capability than one might expect from the size of their active forces. Can we learn something useful from their experience?

At the opening of the conference, I also mentioned improvements in the state of our analytic art. Words like these sound good, but I did have two specific points in mind.

First, I think we are in a better position to integrate more and more elements of manpower policy analysis. Often, we have concentrated on how changing a specific policy would affect some very indirect measure of the success of the system--say, the effect of first-term pay on accessions. Today we can, at the same time, examine other means of affecting that measure (recruiters and advertising, for instance) and ask how alternative changes influence better measures of success--say, the growth of the career force. I hope that future research will allow us to examine still more policy options in a unified context and to place analysis of manpower issues on a level that can be understood better by those who put together the Defense budget.

That is the second new path on which manpower analysis is, I hope, ready to walk. We have often been the stepchildren of defense planners because we don't speak the right language. The logistics community has shared this burden. They talk about the degree to which more money will increase their fill rate. We talk about the degree to which more money will increase our retention rate. These approaches beg for, and often get, the response, "How will that help beat the Russians?" That question is both naive and unfair, but it is natural. With, perhaps, some exceptions, manpower is just not as sexy or as obviously related to war-fighting capability as shiny, new hardware.

I think that people and proficiency are generally far better buys than hardware, but we have to do a better job of proving it to win the battle of the budget. We can do it, though it will take a while.

At CNA, we have adapted some of our old work on personnel productivity, to compare the costs of two ways of buying more deployed capability: either buying more equipment or buying more people to keep the equipment working. We found the people cost a fourth as much. Our experience is surely not unique. Relating resources to readiness, the kind of connection I just described, is probably very much in the interest of the Navy manpower community.

So, where are we? The Navy can probably get through the manpower problems of the '80s, simply by doing business as usual. But good research can help the Navy do better. If we can't get the funding we need to do the job, however, the best research in the world will

yield nothing more than poignant might-have-beens. Research that shows the contribution of manpower expenditures to defense may be the most valuable of all.

Our purpose at this conference has been to develop a context for research. I hope we can continue such meetings over the next few years, perhaps devoting ourselves more to asking how current research fits into that

context. We've had some discussions with other interested organizations about sharing the job of institutionalizing this process. If you have any suggestions, please tell me.

I know how tough it is to take two days out of a busy schedule for long-range planning. I hope you found this meeting worthwhile. Thank you all for coming.

**APPENDIX A**  
**LIST OF PARTICIPANTS**

**APPENDIX A  
LIST OF PARTICIPANTS**

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Lieutenant Commander S. Robinson, USN, *Office of the Chief of Naval Operations*  
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